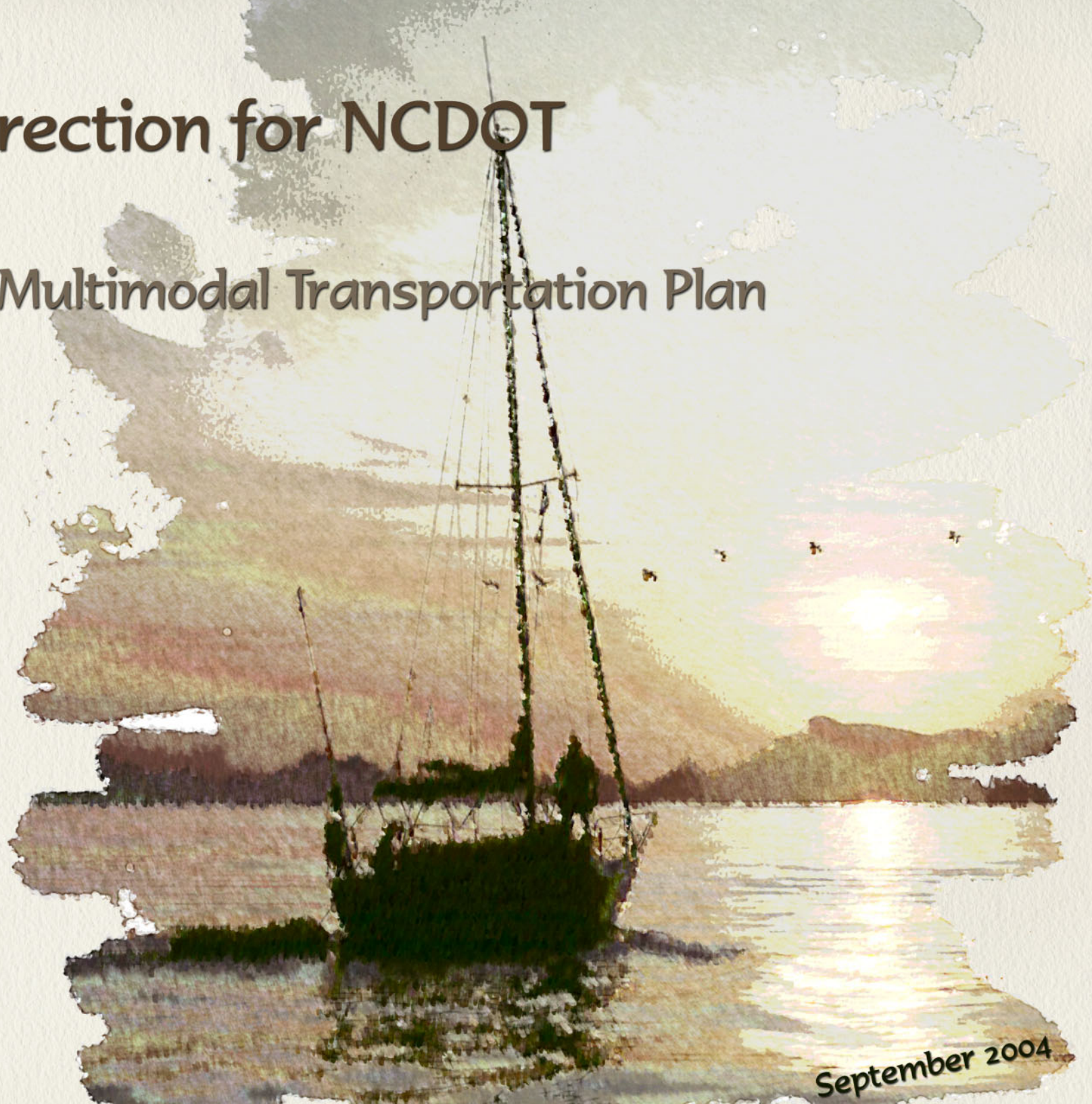


# Charting a New Direction for NCDOT

## North Carolina's Long-Range Statewide Multimodal Transportation Plan



September 2004





The North Carolina Department of Transportation (NCDOT) gratefully acknowledges the commitment, cooperation, and professional contributions of the following:

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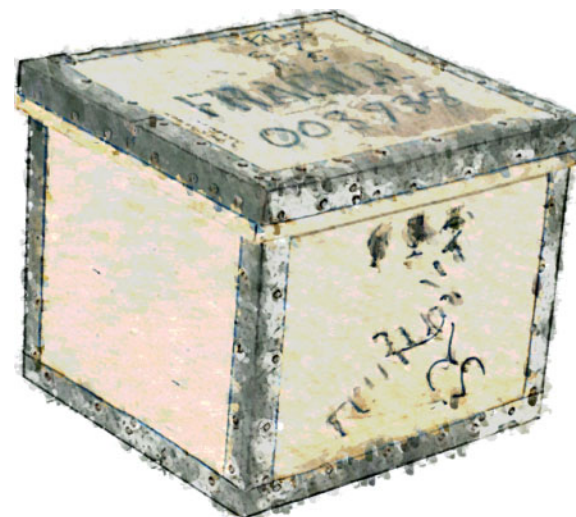
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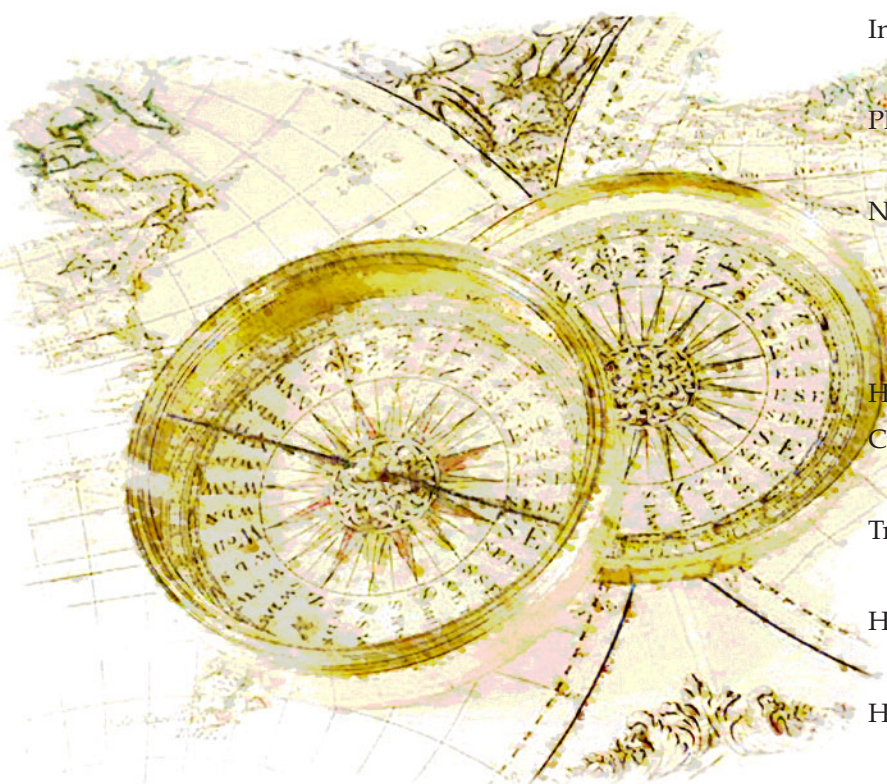
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from the office of  
Lyndo Tippet



## A Message from the Secretary for the Statewide Transportation Plan

The North Carolina Department of Transportation (NCDOT) affects the lives of citizens every day. The Department serves as a caretaker of a sizeable transportation system, including 78,000 miles of roadway, 74 public airports, public transportation in all 100 counties, two major passenger train routes, statewide bicycle routes and ferry service along eight coastal routes. Our highway and ferry systems are the nation's second largest and the Bicycle and Pedestrian Division is the oldest of its kind in the country.

In support of Governor Easley's vision for *One North Carolina*, NCDOT strives to bring safe, effective and efficient transportation within reach of all its citizens. Continuing to serve our citizens while simultaneously preparing to meet future needs is a challenging task. This challenge underscores the importance of the state's Long-Range Statewide Multimodal Transportation Plan, simply referred to as the Statewide Transportation Plan. Updating this plan was a major endeavor for the Department and the Board of Transportation. As a result of much diligence and leadership, we now have a virtual blueprint to help us plan the future. The Statewide Transportation Plan not only lays out the Department's investment priorities but also charts a new transportation direction for North Carolina.

The Statewide Transportation Plan is an important first step for both the Department and the state. It recommends a new 25-year policy and investment strategy that embraces all transportation modes and is based on the Department's guiding principles. These include *balance, choice, effective decision-making, partnership and stewardship*.



Moreover, the Statewide Transportation Plan reflects over three years of citizen involvement, staff analysis and management input.

The centerpiece of the Statewide Transportation Plan is the *Recommended Investment Scenario*—a strategy that proposes targeted levels of funding within major transportation categories. This strategy will serve as a policy guideline to support future investment decision-making. Estimates of both infrastructure needs and available revenue help us understand the importance of making informed, realistic decisions that maximize our financial resources.

Although the Statewide Transportation Plan does not focus on specific projects, it does recommend a series of key action steps. Each step supports the *Recommended Investment Scenario* and requires coordination, commitment and time. Moving the Statewide Transportation Plan forward will take a collaborative approach, involving North Carolina's Legislature, Board of Transportation, and federal, regional, and local agency participation. It should be seen as a "living document" that focuses our resources on:

- ✓ Increasing the flexibility and strategic focus of transportation planning and programming
- ✓ Strengthening stakeholder partnerships to support the development of sustainable, vibrant communities
- ✓ Promoting economic vitality while preserving and enhancing natural and cultural resources
- ✓ Reporting progress and establishing a process to routinely reassess statewide transportation needs

With your help, we can make the vision of this plan a reality. Implementing this plan will help us improve the statewide movement of people and goods, build a safer, more modern transportation system and protect the investment in our existing infrastructure. Together we can build a world-class transportation system that keeps pace with the demands of the 21<sup>st</sup> century and enhances the quality of life for all of our citizens for many years to come.

Lyndo Tippet  
Secretary of Transportation



## Executive Summary

North Carolina's new Long-Range Statewide Multimodal Transportation Plan (hereafter referred to as the Statewide Transportation Plan) stakes out a bold, ambitious course of action for NCDOT. It also reflects a greatly enhanced focus on providing and supporting a truly modern, well-maintained, and multimodal transportation system. The updated Statewide Transportation Plan is an important first step in charting a new direction for NCDOT and the State. It not only recommends a new, 25-year investment strategy that embraces all modes, it also introduces a new planning framework that is inclusive, technically sound, and reflects financial realities.

The new Statewide Transportation Plan is the product of an intensive, three-year planning process that included technical analysis, public outreach, and strategic planning. The centerpiece of the Statewide Transportation Plan is the *Recommended Investment Scenario* — a strategy that proposes targeted levels of funding within major transportation categories. This strategy will serve as a policy guideline to support future investment decision-making. A few important caveats should be noted about the *Recommended Investment Scenario*:

- It is not a remedy to fix all of the State's transportation challenges; it identifies a funding gap that leaves nearly *one-third* of all needs unmet if no additional revenues are obtained.
- It is not rigid; it maintains NCDOT's short-term commitments and recognizes differing regional needs within the context of a statewide vision.
- Implementation of the *Scenario* will face hurdles; full Statewide Transportation Plan execution will require fundamental changes to existing State statutes and programming structures.

## Transportation Trends and Challenges

Several considerations contribute to North Carolina's current and future transportation challenges. These include:

- **North Carolina's Economy** — The State's diverse regional economies, fueled by both traditional and emerging industries, are placing significant pressure on the State's existing transportation system and creating new infrastructure needs.



- **Domestic and International Trade** — Free trade initiatives and greater use of technology in production and delivery systems are increasing demand for efficient, multimodal freight facilities.
- **Population Trends** — The State's population expanded by over 35 percent from 1980 to 2000; it is expected to grow at a similar rate over the next two decades.
- **Travel Trends** — Suburbanization is increasing; the typical commuter in North Carolina now spends 35 more hours per year in traffic than they did 10 years ago.
- **Historic Investment Pattern** — Legislative mandates and past Department policies have required NCDOT to emphasize new highway construction, resulting in growing backlogs of deferred system preservation and non-highway investment needs.

## Available Resources

Estimating the revenues that will be available for transportation over the 25-year Statewide Transportation Plan horizon is an important aspect of the planning process; it establishes a baseline financial forecast to ensure that the vision and breadth of the Statewide Transportation Plan is tempered by financial realities.

North Carolina currently raises more than \$3 billion annually through transportation-related fees, taxes and federal transfers, three-quarters of which is available for transportation investment. Based on conservative assumptions about revenue growth and adjusting for inflation, NCDOT estimates that a total of **\$55 billion** (constant 2001 dollars) will be available for transportation investment in North Carolina over the next 25 years.

## System Needs

A state's transportation system consists of all transportation modes and the facilities that link them together. Thus, a true "multimodal" statewide transportation plan must identify and evaluate a full spectrum of future transportation needs and potential solutions by mode and by function. To support this broad analysis, NCDOT introduced a new planning framework referred to as the North Carolina Multimodal Investment Network (NCMIN). The NCMIN organizes all transportation facilities by interest, travel function, role, and use, as well as by one of three "tiers" (Statewide, Regional, and Subregional).

In total, the Statewide Transportation Plan identifies that North Carolina will need to spend more than **\$84 Billion** (constant 2001 dollars) over the next 25 years to meet all anticipated transportation investment needs. Total needs figures, by mode, are provided in the table below (figures reflect the combined backlog and accruing needs for maintenance, preservation, modernization, and expansion).

25-Year Needs (billions of constant 2001 dollars)				
Mode	Statewide	Regional	Subregional	Total
Highways	\$31.090	\$9.087	\$26.407	<b>\$66.584</b>
ITS	\$1.092	—	—	<b>\$1.092</b>
Transit	—	\$6.500	\$4.100	<b>\$10.600</b>
Passenger Rail	\$2.923	\$.572	—	<b>\$3.495</b>
Freight Rail	\$.282	—	\$.263	<b>\$.545</b>
Ferries	\$.749	\$.310	—	<b>\$1.059</b>
Bike/Ped	\$.030	\$.030	\$.240	<b>\$.300</b>
Aviation	N/A	N/A	N/A	<b>\$1.017</b>
<b>Total</b>	<b>\$36.166</b>	<b>\$16.499</b>	<b>\$31.010</b>	<b>\$84.692</b>

Recommended Investment Scenario

Faced with a \$30 billion gap between long-term needs and revenues, NCDOT must craft a direction that optimizes the use of scarce resources. The Department's response to this challenge, and the culmination of the statewide planning initiative, is a proposed 25-year *Recommended Investment Scenario* that establishes transportation investment priorities and suggests targeted expenditure levels for specific programs and improvement categories.

Highlights of the *Recommended Investment Scenario* include:

- It underscores the importance of *safety* in all investments.
- It emphasizes greater investment in the State's highest-use facilities — elements that support high levels of demand and play a critical role in enhancing statewide mobility.
- It supports increased investment in non-highway modes; areas that historically have received a disproportionately low percentage of State transportation funding.

*The Recommended Investment Scenario places a focus on upgrading and preserving the existing transportation system by increasing investment in highway modernization, as well as maintenance/preservation activities for all modes.*

Implementation

The adoption of this Statewide Transportation Plan is an important accomplishment, but it is only a first step. Full implementation of the *Recommended Investment Scenario* will occur incrementally, over an extended timeframe. Consequently, Statewide Transportation Plan implementation progress should be monitored, and the Statewide Transportation Plan should be routinely updated (on 2- and 4-year cycles) to reflect both changing needs/resources (data) and evolving staff and stakeholder interests (direction). A concerted and consistent effort by NCDOT will be needed to enact change through the following key action steps:

- Create an Implementation Team
- Create a Board of Transportation (BOT) Statewide Transportation Plan Committee
- Pursue Legislative Opportunities for Greater Flexibility
- Improve Planning Integration
- Improve Project Selection Process
- Invest in Department-wide Tools
- Monitor and Report Progress
- Establish Statewide Transportation Plan Revision Cycles
- Advance the Strategic Highway Corridors Concept

Final Considerations

Clearly, NCDOT will need additional resources to meet all of the State’s transportation investment needs over the next 25 years. Similar to other states, North Carolina faces a financing challenge characterized by a funding “pie” that is simply not big enough to address expected needs. The \$30 billion shortfall, and the implications of not addressing it, set the stage for discussions about potential ways to increase transportation revenues. This dialogue should include a review of existing fee structures and funding mechanisms and must also include alternative financing packages, such as (but not limited to) local tax options, local cost sharing, user based fees, and debt issuance. Additionally, decision-makers must consider which currently unmet needs would be addressed if additional revenues were available.



## Introduction

When NCDOT embarked on its mission to update the Statewide Transportation Plan, it staked out a bold, ambitious course of action. The Department's leadership also decided that the time was right to take a hard look at its current investment strategy and to take the remaining steps to transform the agency's focus to providing and supporting a truly multimodal transportation system.

The need for safe, efficient, and effective transportation choices is undisputed, but prioritizing transportation investment options is an enormous challenge. Travel growth across all modes has created additional infrastructure needs and is increasing the burden of maintaining existing facilities. At the same time, planning and implementing transportation improvements has become more complex and costly due to the increased importance placed on environmental, land use, and social equity concerns. The bottom line is that NCDOT's currently available resources simply cannot address all of the State's transportation investment needs.

In light of the hard choices it faces, NCDOT recognized the need to reconsider the way it makes transportation investment decisions. This Statewide Transportation Plan is an important first step in charting a new direction for NCDOT and the State. The Statewide Transportation Plan not only recommends a new long-term investment strategy that embraces all modes, it also introduces a new planning framework that is inclusive, technically sound, and reflects financial realities.

## Statewide Transportation Plan Purpose

The overriding purpose of this Statewide Transportation Plan is to establish a long-range blueprint for transportation investment in North Carolina. The Statewide Transportation Plan also provides a balanced picture of the State's transportation challenges and opportunities based on anticipated resources, projected passenger and freight movement needs, and estimated improvement costs. The end result is a preferred North Carolina transportation investment strategy for the next 25 years.

The preferred strategy, formally known as the *Recommended Investment Scenario*, is not intended to be prescriptive. Instead, it is meant to serve as a flexible policy guideline, and should be considered in light of the following caveats and considerations:

- The *Recommended Investment Scenario* was developed independently of legislative mandates and existing policy considerations. Full implementation will require fundamental changes to existing State statutes and programming structures.
- The *Recommended Investment Scenario* is not a remedy to fix all of the State's transportation issues, nor is it a project-specific list; rather, it proposes targeted investment levels within major improvement categories that will guide project selection.
- The *Recommended Investment Scenario* maintains NCDOT's short-term commitments, yet also charts a new long-term direction that proposes incremental changes over time.
- The *Recommended Investment Scenario* was not developed in isolation - it reflects extensive stakeholder and public input.
- The *Recommended Investment Scenario* requires year-to-year financial balance and allocation to address differing regional needs and priorities.
- The *Recommended Investment Scenario* will not be implemented overnight. It will require continued active involvement and a sustained commitment from NCDOT staff, management, and the BOT.
- The *Recommended Investment Scenario* identifies a funding gap that leaves nearly *one-third* of all needs unmet; without additional revenues, NCDOT cannot meet the State's transportation investment needs for the 21st Century.

*The overriding purpose of North Carolina's Statewide Transportation Plan is to establish a long-range blueprint for transportation investment in the State.*

*North Carolina's Statewide Transportation Plan is an important first step in charting a new direction for NCDOT and North Carolina.*





## Planning Process and Requirements

This Statewide Transportation Plan is an update of North Carolina's first Statewide Transportation Plan that was completed in 1995. While the effort to develop this Statewide Transportation Plan did not start anew — it built upon the work undertaken to develop the initial Statewide Transportation Plan — it still required a large, three-year, multifaceted initiative that incorporated the following critical requirements, building blocks, and considerations:

- **Legal and Regulatory Requirements** — Federal law mandates that each state maintain an up-to-date, 20-year plus transportation plan that is fiscally constrained, considers seven key planning factors (see chart at right), and serves as the primary mechanism for cooperative transportation decision-making.
- **Strategic Direction** — A critical first step in the Statewide Transportation Plan update process was to establish goals and objectives that articulated NCDOT's desired long-range direction and supported Statewide Transportation Plan decision-making.
- **Economic Analysis** — The transportation implications of North Carolina's economic and demographic trends were evaluated and considered throughout the planning process.
- **Analytical Framework** — To describe North Carolina's transportation system from a functional perspective, NCDOT established the North Carolina Multimodal Investment Network (NCMIN). The NCMIN represents the major physical framework upon which other components of the Statewide Transportation Plan could be applied, particularly transportation investment and economic development strategies.
- **Existing System Review** — A comprehensive inventory of state transportation system components (all modes) provided a starting point for consideration of investment needs.
- **Needs Analysis** — 25-year investment needs were determined through a rigorous technical analysis of system deficiencies, which assessed maintenance, preservation, modernization, and expansion for all modes.

- **Public and Partner Outreach** — To ensure the Statewide Transportation Plan reflects public sentiment, NCDOT conducted a vigorous public involvement program using a variety of media to incorporate relevant agencies, key stakeholders, and the general public into development of the Statewide Transportation Plan.
- **Resource Forecasting** — A comprehensive, yet conservative and realistic 25-year estimate of North Carolina transportation revenues (based on existing sources) provided planners with a means to infuse "financial realities" into the planning process.
- **Recommendation Development** — To inform the decision-making process, NCDOT created a series of investment scenarios based on revenue forecasts for the 25-year Statewide Transportation Plan horizon and varying allocations of resources between need categories (e.g., expansion vs. system preservation).

### *Federal Planning Requirements*

*TEA-21, the most recent federal transportation law, identifies seven broad areas to be considered in statewide planning processes:*

- 1. Support the economic vitality of the United States, the states, and metropolitan areas, especially by enabling global competitiveness, productivity, and efficiency.*
- 2. Increase the safety and security of the transportation system for motorized and non-motorized users.*
- 3. Increase the accessibility and mobility options available to people and for freight.*
- 4. Protect and enhance the environment, promote energy conservation, and improve quality of life.*
- 5. Enhance the integration and connectivity of the transportation system, across and between modes throughout the state, for people and freight.*
- 6. Promote efficient system management and operation.*
- 7. Emphasize the preservation of the existing transportation system.*



## North Carolina's Transportation Challenges

A successful statewide transportation plan must build from a firm understanding of a state's critical transportation challenges and issues. For North Carolina, this includes demographic and economic trends, institutional considerations that influence investment needs, and historical investment patterns.

### Demographic and Travel Trends

North Carolina is experiencing rapid growth. The State's population expanded by over 35 percent from 1980 to 2000, led by strong growth in the Charlotte, Raleigh/Durham, and Wilmington areas. By 2020 North Carolina's population is expected to expand an additional 25 to 30 percent. This growth, along with other demographic trends and shifts in the economy add to the State's transportation capacity challenges.

- Household income in the State has risen dramatically, further fueling recreational and tourism travel, and adding to overall vehicle trips per household.
- Due in part to suburbanization, the typical North Carolina commuter now spends an additional 35 hours per year in traffic versus 10 years ago.
- Vehicle miles traveled (VMT) has increased by nearly 40 percent from 1990 to 2000 (VMT is a common industry measure for travel demand).

### The North Carolina Economy

North Carolina is characterized by diverse regional economies defined by traditional and emerging industries. The Charlotte area has a strong concentration of high value services such as banking, the Southeast region is centered on the US military presence, the Mountains, Northeast region and the Outer Banks drive a burgeoning tourism economy, the Triad is home to numerous manufacturing and logistics industries, and the Research Triangle region is touted for its technology-related businesses and higher education facilities. North Carolina is a national leader in turkey and pork production, and the State is home to many prominent agri-business industries. Additionally, an influx of retirees moving into coastal and mountain communities is changing the health and service sectors in concentrated areas of the state. Accurately predicting the future of North Carolina's economy over the next 25 years is difficult, however promising new sectors are on the horizon. Biotechnology has the potential

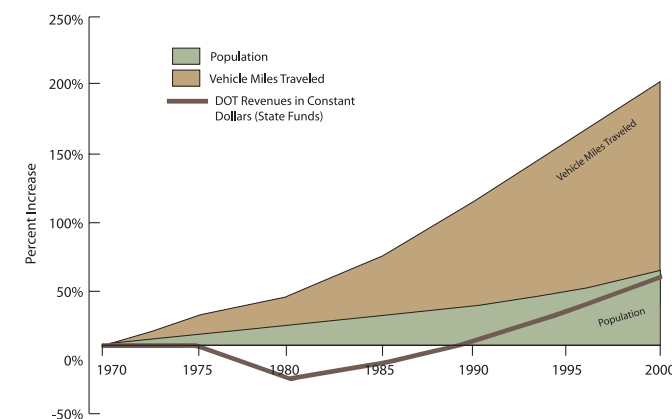


to transform both rural and urban areas of the state. Automotive and vehicle parts manufacturing is steadily growing in the southeastern United States, with North Carolina poised to capture a share. Advanced medical care, homeland security, and logistics are potential economic catalysts. Other, less predictable technologies, such as nanotechnology and informatics may act as transforming agents and cause ripple effects in the state's economy. Regardless of the industry, the trends point to the need for a more reliable, cost-effective, and efficient transportation system. The ability to sustain economic prosperity will increasingly rely on transportation as the core component of a broader, global economic supply chain.

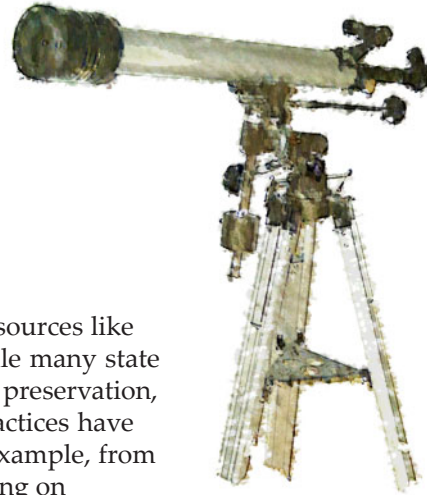
### Domestic and International Trade

Recent national and global economic policies, such as North American Free Trade Agreement and other free trade initiatives, along with new alliances in international markets will accelerate North Carolina's import/export commerce in the future. Domestic tonnage carried along U.S. freight systems is expected to increase by 67 percent, while international trade will nearly double by 2020. This drastic level of demand on the system will increase pressure on major transportation corridors that pass through the state, further stressing aging port (air and sea), rail, and highway infrastructure. Delivery time and service reliability will increase the need for integrated transportation, e.g., coordinated intermodal and multimodal transportation networks and distribution hubs. To stay competitive in this changing global environment and to capitalize on promising economic opportunities, NCDOT must support the efficient movement of freight along and between modes of transportation. In particular NCDOT must:

- Provide efficient trucking/rail transport services between gateways, intermodal terminals, and manufacturing and agricultural centers.
- Capitalize on multimodal opportunities and create flexible transportation services that support the shift to a service-based, just-in-time economy.
- Improve mobility in strategic corridors; modernize connections to these corridors (i.e., primarily, National Highway System Connectors that link activity/distribution centers in urban and rural areas).



*Economic Trend: The U.S. maritime industry foresees container traffic doubling along every East Coast port by 2020.*



## Historic Investment Practices

From the 1950s to the 1980s, North Carolina focused its resources like most states, on construction of the Interstate system. While many state DOTs have recently begun to redirect resources to system preservation, safety, and non-highway modes, NCDOT's investment practices have continued to emphasize new highway construction. For example, from 1995 to 2000, NCDOT spent roughly 62 percent of its funding on highway upgrades and expansion.

Many of NCDOT's spending decisions are governed by state legislative mandates or are predetermined based on federal requirements. The NCDOT budget derives its revenue from three primary sources:

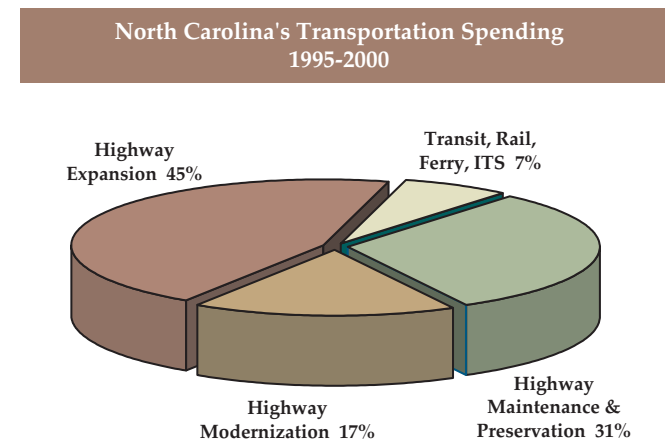
- *Highway Fund* - Monies from this long-established state fund are legislatively appropriated for such activities as maintenance, paving unpaved secondary roads, motor vehicle administration, state aid to municipalities, and ferry system operation. Less than half of available revenue is appropriated for roadway maintenance or preservation activities.
- *Highway Trust Fund* - Established in 1989, this fund has specific statutory purposes. The two primary elements are completion of the Intrastate system, a 3600-mile network of four-lane highways, and construction of designated Urban Loops. The fund also provides supplements for paving unpaved secondary roads, and state aid to municipalities.
- *Federal Funds* - These include annual formula-based apportionments as well as competitive and discretionary grant funds. Apportionments in particular are made through various "core" programs that have specific purposes, e.g. Interstate and National Highway System improvements, and therefore provide limited programmatic flexibility.

NCDOT strives to balance funding source constraints with priorities identified through the public input process as it develops its biennial State Transportation Improvement Program (STIP). The STIP offers funding information and cost estimates associated with a seven-year schedule of projects covering all modes of transportation. No Highway Fund dollars are appropriated for STIP construction. Thus, the STIP is funded largely by Federal-aid apportionment, Intrastate Funds, or Urban Loop funds. Approximately 46 percent of the total STIP budget is directed to the completion of Urban Loops and the Intrastate system.

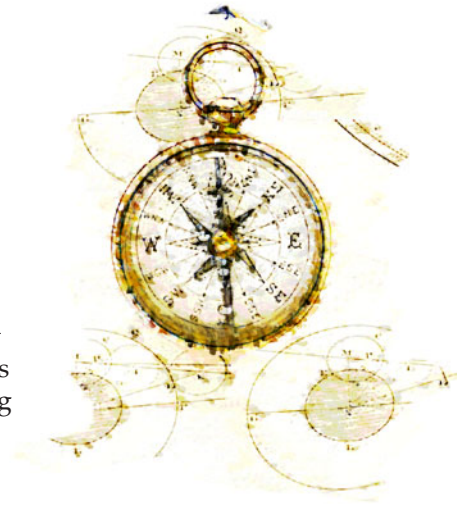
Consequently, NCDOT is required to commit a large share of agency funds to major highway construction activities. These initiatives are frequently expensive, complex, and often delayed due to environmental studies and project design challenges. At the same time, spending decisions for non-highway modes are isolated from highway funding issues and handled within a short-term context, making long-term capital planning for these modes more difficult.

The Department's highway expansion focus has not come without a cost — North Carolina has a growing backlog of deferred system preservation and non-highway investment needs. This backlog is compounded by the fact that NCDOT is responsible for the second-largest state highway system in the country and owns a four times greater share of state roads than the average state DOT. Some significant realizations about the State's transportation challenges uncovered during the development of this Statewide Transportation Plan include:

- Between 2000-2002, nearly 80 percent of all fatal crashes on North Carolina state-maintained highways occurred on rural routes.
- North Carolina ranks 22<sup>nd</sup> in pedestrian fatalities — this is an above-average rate compared to peer states of similar size and population.
- Nearly 32,000 miles of NCDOT highways (40 percent of all mileage) have significant pavement condition deficiencies and nearly 7,000 bridges are deficient.
- Between 1975 and 2000, North Carolina had the lowest traffic fatality improvement rate in the country.
- NCDOT currently under-funds maintenance by \$280 million per year and no additional revenues have been identified to address future maintenance burdens created by new highway lane miles.
- Public transportation services throughout the State are hampered by outdated vehicles and inadequate operating revenues, leading to reductions in service quality and scope.
- Many of the State's roadways are antiquated — nearly 8,800 miles have narrow lanes and shoulders, and many facilities require a variety of safety upgrades.



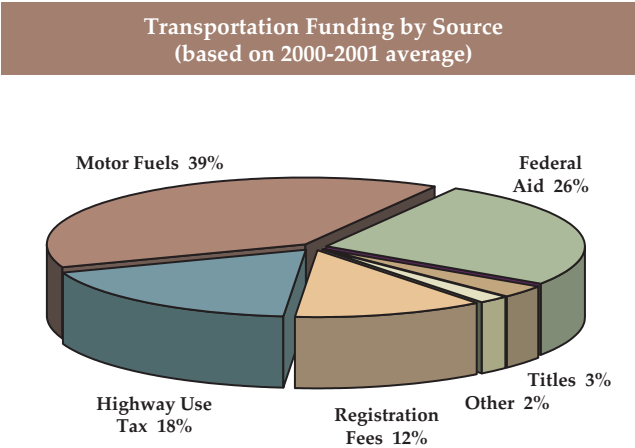




### Current Funding Levels

North Carolina's transportation revenue sources currently yield more than \$3 billion annually. Major revenue sources and their associated contribution to transportation funding (2001 figures) are as follows: <sup>1</sup>

- State motor fuels tax, currently 24.1 cents/gal = \$1.16 billion
- Highway use tax (3% vehicle sales tax) = \$550 million
- Vehicle titles = \$95 million
- Truck/auto registration fees and licenses = \$350 million
- Federal aid = \$775 million
- Other (interest, inspections, permits, penalties) = \$50 million
- General Fund = \$15 million



<sup>1</sup> Transportation bonding, a highway program funding mechanisms used in North Carolina throughout the 1990s, is excluded from the list since all remaining bonding authority is targeted toward the new *NC: Moving Ahead!* initiative.

### Future Funding

The amount of funding available to NCDOT for transportation investment over the next 25 years is challenging to accurately predict. Nonetheless, planners and decision-makers must establish a baseline financial forecast to ensure that the vision and breadth of long-range plans are tempered by financial realities. To ensure the revenue forecast used for this Statewide Transportation Plan update was comprehensive yet conservative, NCDOT used the following **assumptions** to guide development of the baseline projection:

- No new revenue sources over the 25-year time line.
- Continued growth of current State user fee "transfers." <sup>2</sup>
- Increases in Federal-aid funding at a conservative, annual average growth rate of 1.8 percent.
- Annual growth in State user fee revenues based on historical patterns — roughly 3 percent for motor fuels and 4 percent for registration and use tax.
- To reflect the true buying power of future revenues, estimates were converted to constant 2001 dollars using a discount rate (i.e., **assumed** annual inflation rate) of 3 percent.

Based on these **assumptions**, NCDOT estimates that a total of \$55.5 billion will be available for transportation investment in North Carolina over the next 25 years. <sup>3</sup> The details of this estimate are provided in the table below.

25-year Baseline Revenue Forecast (billions of constant 2001 dollars)				
Revenue Type	2001	2012	2025	25-Year Total
Federal Funds	\$.781	\$1.021	\$1.203	\$25.541
State Funds	\$2.306	\$3.071	\$5.143	\$87.454
Subtotal Revenues	\$3.087	\$4.092	\$6.346	\$112.995
Less Transfers	(\$.835)	(\$1.265)	(\$1.842)	(\$32.832)
Revenues Available (nominal dollars)	\$2.252	\$2.827	\$4.504	\$80.163
Revenues Available	\$2.252	\$2.187	\$2.216	\$55.541

<sup>2</sup> Transfers for DMV, Powell Bill, non-highway support, driver's education, and debt service were assumed to increase at 3 percent annually. General Fund transfer, State Highway Patrol, and DOT administration were assumed to increase at 4 percent annually, and DOT capital was estimated to grow at 2 percent per annum.

<sup>3</sup> Revenue estimates do not include aviation funding, which is dedicated for specific aviation purposes and thus, unavailable to fund non-aviation investments.



## Transportation System Investment Needs

A state's transportation system consists of all transportation modes and the facilities that link them together. Thus, a true "multimodal" statewide transportation plan needs to identify and evaluate investment needs and solutions by mode and by function. "Mode" simply refers to the facilities associated with transportation mechanisms, such as highways and transit systems. "Function" refers to the type of travel — statewide, regional, or local — served by a combination of modes. To support this latter type of analysis, NCDOT created the *North Carolina Multimodal Investment Network* (NCMIN).

In total, the Statewide Transportation Plan identifies that North Carolina will need to spend approximately \$84 billion (constant 2001 dollars) over the next 25 years to meet all anticipated transportation investment needs. These needs fall into four major investment categories:

- **Maintenance** — Regular, routine roadway and bridge treatments that sustain existing highway conditions (e.g., pothole patching and bridge painting).<sup>4</sup>
- **Preservation** — Activities that protect the infrastructure and extend facility service life (e.g., roadway resurfacing or bus refurbishment).
- **Modernization** — Upgrades to system safety, functionality, and overall operational efficiency, without adding physical capacity (e.g., intersection improvements and rolling stock upgrades).
- **Expansion** — Activities focused on adding capacity or new facilities/services (e.g., adding highway lanes or new transit routes).

Highway and bridge needs were determined using a combination of a time-based modeling package, source data, and other analytical processes. The NCMIN was used to help manage this process by organizing each highway facility into one of three "tiers" based on primary transportation function. The Department then evaluated the existing system using a set of minimum tolerable conditions and established design standards to determine deficiencies and

needed improvements with respect to both backlog (existing) needs and accruing (future) needs. Needs were totaled and expressed as an overall construction cost.

Non-highway mode needs were estimated using a combination of source data, reports, and input from NCDOT staff. These figures included the capital and operating costs associated with continuing and improving existing services along with the costs associated with providing new services/facilities. Once established, non-highway needs estimates were grouped by "tier" and by "improvement category" similar to the highway/bridge analysis. While non-highway results are not shown as "backlog" and "accruing" needs, the analysis did account for both immediate and future needs.

The NCMIN is a tool to organize and analyze transportation facilities within the context of a broad system. Each facility, regardless of mode, is grouped under one of three tiers, as follows:



**Statewide Tier** — Facilities such as Interstates, Amtrak routes, and major commercial service airports, which serve long-distance trips, connect major population centers, have the highest usage, and primarily provide a mobility function.



**Regional Tier** — Facilities such as NC Routes and commuter rail systems, which connect regional centers and typically serve high levels of demand for short distance (e.g., commuter travel).



**Subregional Tier** — Facilities such as secondary roads, local transit systems, and non-commercial service airports, which serve localized, short distance movements, have low demand, and provide land access to businesses and residences.

<sup>4</sup> Note: The maintenance category only applies to the highway mode because similar "sustaining" activities for non-highway modes are classified as *Preservation*.



## Highways & Bridges

North Carolina has 99,787 miles of public roadways and 18,184 highway bridges. Of this total, NCDOT maintains 78,245 miles and 17,482 bridges, with the remaining mileage under the jurisdiction of North Carolina's municipalities. The vast majority of State-maintained roadway facilities are classified as secondary routes, with "signed routes" (those which display US, NC or Interstate shields) accounting for only 18 percent of the centerline mileage maintained by NCDOT. Major functional elements of the State Highway System include:

- **Statewide Tier** — Includes all Interstate highways, Intrastate highways, and major US routes; these facilities account for over 50 percent of the travel on state-maintained roadways.
- **Regional Tier** — Includes remaining US routes, major State routes, and some secondary routes providing regional connectivity; these facilities accommodate roughly 20 percent of the travel on State-maintained roadways.
- **Subregional Tier** — Includes State routes providing limited connectivity and all remaining secondary routes; these facilities account for about 30 percent of the travel on State-maintained roadways.

## Highway and Bridge Needs - \$ 66.6 Billion

The needs analysis identified \$66.6 billion in highway and bridge needs over the 25-year planning horizon — \$31.1 billion for statewide highways, \$9.1 billion for regional facilities, and \$26.4 billion for subregional roadways. These figures include both backlog (existing) and accruing (future) needs, which are reflected under the four major needs categories in the table on page 12. The pie chart to the right shows the distribution of needs by expenditure category.



## Observations

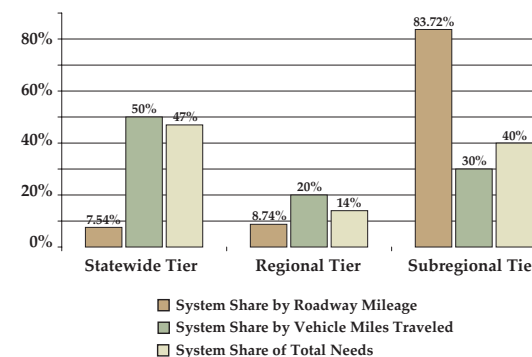


- Almost half of all highway investments needs are backlog needs due to existing deficiencies or capacity shortfalls.
- Highways that serve "statewide" functions represent only eight percent of total highway systems miles, but account for half of the statewide miles traveled and nearly half of total highway investment needs.
- The Strategic Highway Corridors concept (page 23) is an important planning opportunity based on maximizing the use of existing highway infrastructure.

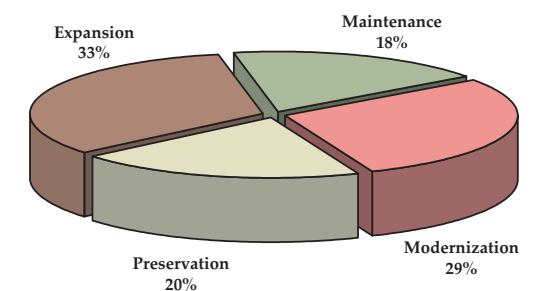


*The State faces a mounting backlog of rough pavements and structurally deficient bridges. More than 4,000 miles of State highways and 260 State bridges are added to the backlog each year.*

Highway System Tiers  
Mileage vs. Usage vs. Needs



Highway Bridge Needs by Improvement Type  
(total needs = \$66.6 billion)



## Intelligent Transportation Systems

Intelligent Transportation Systems (ITS) are defined as “activities that incorporate current and evolving computer and communication technologies into the transportation infrastructure to provide safer, more efficient, and better coordinated solutions to today's transportation problems.” Traditionally, these activities have not been viewed as a stand-alone transportation mode. Over the last decade, however, the transportation industry has grown to view ITS as a unique, strategic investment that can enhance all aspects of transportation.

ITS applications act to “modernize” existing infrastructure, generally leading to operational efficiencies. Examples of services, as seen from a user perspective, cover the following seven areas:

- **Travel and Traffic Management** — Real-time adjustments to traffic control systems in response to changing conditions.
- **Public Transportation Management** — Systems that improve transit operations, such as priority controls for traffic signals.
- **Electronic Payment** — Methods for collecting fees and payments, such as in-vehicle transponders for toll roads.
- **Commercial Vehicle Operations** — Applications that streamline and automate trucking enforcement.
- **Emergency Management** — Systems that improve the response time and effectiveness of emergency responders.
- **Advanced Vehicle Safety Systems** — In-vehicle applications that improve safety, such as collision avoidance systems.
- **Information Management** — Applications that improve real-time communication with system users.

## ITS Needs - \$1.1 Billion

From 1999-2002, NCDOT underwent a process to identify ITS-related needs in nine Planning Areas:

- **Urban Planning Regions** — Asheville, Fayetteville, Metrolina, Triad, Triangle, and Wilmington.
- **Rural ITS Planning Regions** — Coastal, Piedmont, and Mountains.

This effort identified the need for a central traveler information database to assist motorists and resulted in the creation of a statewide ITS Strategic Deployment Plan, including reports/ plans for each Planning Area. These regional plans provide the basis for the 25-year ITS needs estimate contained in the table below.

## Observations

- The total needed capital investment of \$550 million includes \$351 million for initial implementation of the nine deployment plans and an additional \$199 million needed to update and replace these systems over time.
- The annual cost to operate the proposed systems is typically about 8 percent of deployment plan capital costs, leading to \$542 million in total operating costs over the 25-year life of the Statewide Transportation Plan.<sup>10</sup>
- The combined capital and operating ITS costs of \$1.1 billion are needed to improve statewide travel functions and are considered under the modernization and preservation categories.



25-Year ITS Needs (millions of constant 2001 dollars)	
Need Category	Statewide (Total)
<b>Capital</b>	
Deployment Plans	\$351
Replace/Upgrade Systems	\$199
<b>Subtotal Capital</b>	<b>\$550</b>
<b>Operating Costs</b>	<b>\$542</b>
<b>Total</b>	<b>\$1,092</b>

<sup>10</sup> Operating costs are also assumed to increase each year through 2011 as ITS systems are deployed, and are then assumed to remain constant after 2011.



Total Highway Infrastructure Needs Summary (billions of constant 2001 dollars)									
Needs	Statewide		Regional		Subregional		Subtotal		Total
	Backlog	Accruing	Backlog	Accruing	Backlog	Accruing	Backlog	Accruing	
<b>Maintenance</b>									
Roadway Maintenance	\$.011	\$.843	\$.013	\$.977	\$.126	\$9.356	\$.151	\$11.175	\$11.326
Bridge Maintenance	\$.007	\$.047	\$.004	\$.028	\$.033	\$.219	\$.045	\$.294	\$.339
<b>Subtotal Maintenance</b>	<b>\$.018</b>	<b>\$.890</b>	<b>\$.018</b>	<b>\$1.005</b>	<b>\$.160</b>	<b>\$9.574</b>	<b>\$.196</b>	<b>\$11.469</b>	<b>\$11.665</b>
<b>Preservation</b>									
Existing Network	\$.076	\$4.167	\$.011	\$1.164	\$.961	\$5.505	\$1.048	\$10.836	\$11.884
Bridge Preservation	\$.007	\$.177	\$.004	\$.106	\$.033	\$.823	\$.045	\$.1106	\$1.151
ITS	—	\$.370	—	—	—	—	—	\$.370	\$.370
<b>Subtotal Preservation</b>	<b>\$.083</b>	<b>\$4.714</b>	<b>\$.015</b>	<b>\$1.270</b>	<b>\$.994</b>	<b>\$6.328</b>	<b>\$1.092</b>	<b>\$12.312</b>	<b>\$13.404</b>
<b>Modernization</b>									
Existing Network	\$1.730	\$2.957	\$2.323	\$1.076	\$3.910	\$2.175	\$7.963	\$6.208	\$14.171
Bridge Widening	\$.549	—	\$.210	\$.013	\$.286	\$.056	\$1.045	\$.069	\$1.114
Bridge Rehabilitation	\$.193	\$.828	\$.087	\$.131	\$.093	\$.306	\$.373	\$1.265	\$1.638
Bridge Replacement	\$.363	\$.032	\$.331	\$.188	\$.656	\$1.038	\$1.350	\$1.258	\$2.608
RR/Hwy Grade Crossings	—	\$.005	—	\$.005	—	\$.051	—	\$.061	\$.061
ITS	—	\$.722	—	—	—	—	—	\$.722	\$.722
<b>Subtotal Modernization</b>	<b>\$2.835</b>	<b>\$4.544</b>	<b>\$2.951</b>	<b>\$1.413</b>	<b>\$4.945</b>	<b>\$3.626</b>	<b>\$10.731</b>	<b>\$9.583</b>	<b>\$20.314</b>
<b>Expansion</b>									
Existing Network Capacity	\$7.509	\$5.941	\$1.734	\$.189	\$.239	\$.131	\$9.482	\$6.261	\$15.743
Urban Loops Completion	\$3.410	—	—	—	—	—	\$3.410	—	\$3.41
New Location Identified Needs	\$2.238	—	\$.492	—	\$.410	—	\$3.140	—	\$3.14
<b>Subtotal Expansion</b>	<b>\$13.157</b>	<b>\$5.941</b>	<b>\$2.226</b>	<b>\$.189</b>	<b>\$.649</b>	<b>\$.131</b>	<b>\$16.032</b>	<b>\$6.261</b>	<b>\$22.293</b>
<b>Total</b>	<b>\$16.093</b>	<b>\$16.089</b>	<b>\$5.21</b>	<b>\$3.877</b>	<b>\$6.748</b>	<b>\$19.659</b>	<b>\$28.051</b>	<b>\$39.625</b>	<b>\$67.676</b>



## Observations

- Nearly \$6.5 billion (62 percent) of transit needs are related to the provision of regional transportation functions. The remaining \$4.1 billion in needs (39 percent) will go to providing subregional transit functions.
- Preservation needs for existing services, which include cost for maintenance (e.g., engine overhauls and bus depot repairs) and operating (e.g., driver salaries and fuel), total \$4.3 billion and represent 41 percent of total public transportation needs. Expansion plans total \$6.3 billion, representing the remaining 59 percent of transit needs.
- The conceptual development of additional commuter rail systems serving municipalities surrounding major urban areas is gaining momentum in parts of North Carolina. As these initiatives advance, future Statewide Transportation Plan updates should attempt to quantify expected capital and operating needs of these initiatives.

## Transit

Public transportation in North Carolina is currently provided through 102 transit systems that serve either regional or subregional transportation functions. This includes local bus services in 17 cities, three regional transit systems (Triangle Transit Authority, Piedmont Authority for Regional Transportation, and Charlotte Area Transit System), 70 rural transportation systems, and 12 human service transportation systems that provide service to clients of social service organizations. The State's transit systems carry over 40 million passengers per year and averaged annual ridership growth of 5 percent from 1997-2001.

### Transit Needs - \$10.6 Billion

In 1997, NCDOT established a vision for public transportation in North Carolina as part of its *Transit 2001* study. The vision called for connecting the State with a seamless transportation network by expanding the types and variety of transit services available to meet both urban and rural public transportation needs. It also emphasized the need to introduce new technologies that will reduce costs and improve rider comfort and convenience.

The *Transit 2001* study provided a foundation for determining North Carolina's long-term transit investment needs. Based on the study's findings and subsequent NCDOT staff input, total transit needs (capital plus operating costs) over the 25-year planning horizon amount to \$10.6 billion. The needs include:

- The continuation and expansion of existing bus systems, plus three new services in Goldsboro, Kannapolis, and Jacksonville (\$3.3 billion over the 25-year period).<sup>5</sup>
- Continuation of current funding levels for the rural transit program (\$1 billion over the 25-year period).
- Major investments in New Starts projects in three metropolitan areas (\$6.3 billion over the 25-year period). Anticipated New Starts projects include: Commuter rail in the Triangle region, five rail or bus rapid transit corridors in Charlotte, and rail or bus rapid transit in the Triad region.

25-Year Transit Needs (billions of constant 2001 dollars)			
Need Category	Regional	Subregional	Total
<b>Existing Urban</b>			
Capital	—	\$1.6	\$1.6
Operating	—	\$1.7	\$1.7
<b>Subtotal</b>		<b>\$3.3</b>	<b>\$3.3</b>
<b>Existing Rural</b>	<b>\$0.2</b>	<b>\$0.8</b>	<b>\$1.0</b>
<b>Total Existing</b>	<b>\$0.2</b>	<b>\$4.1</b>	<b>\$4.3</b>
<b>New Starts Services</b>			
Capital	\$5.4	—	\$5.4
Operating	\$0.9	—	\$0.9
<b>Total New</b>	<b>\$6.3</b>	—	<b>\$6.3</b>
<b>Total</b>	<b>\$6.5</b>	<b>\$4.1</b>	<b>\$10.6</b>



<sup>5</sup> Note - Operation of the Goldsboro system began in 2002.



## Passenger Rail

North Carolina's passenger rail facilities primarily serve a statewide transportation function. In FY 2001, State intercity train services (operated by Amtrak) carried 292,977 passengers through the following state-subsidized operations:

- **Carolinian** - Service between Charlotte and Rocky Mount, continuing north to New York.
- **Piedmont** - Service between Raleigh and Charlotte with stops at cities such as Cary, Durham, Burlington, and Greensboro.

Amtrak also operates four long-distance trains in the State:

- **Crescent** — Service between New York and New Orleans with stops in Greensboro, High Point, Salisbury, Charlotte, and Gastonia.
- **Silver Star** — Service between New York and Miami with stops in Rocky Mount, Raleigh, Southern Pines, and Hamlet.
- **Silver Meteor** — Service between New York and Miami with stops in Rocky Mount and Fayetteville.
- **Palmetto** — Service between New York and Miami with stops in Rocky Mount, Wilson, and Fayetteville.

## Passenger Rail Needs - \$3.5 Billion

Passenger rail needs include both capital costs (e.g., acquisition of train sets) and operating costs (recurring costs such as labor and utility bills). The following estimates for needed intercity passenger rail improvements and added services total \$3.5 billion and are based on information contained in the *North Carolina Rail Plan 2000*:

- **Raleigh to Charlotte Corridor** — Track upgrade to accommodate higher-speed service (nearly one hour faster), increase frequency from two to three round-trips per day, and improve track to allow a station in Winston-Salem.<sup>6</sup>
- **Western North Carolina** — Establish a new rail corridor to provide two daily round-trips between Salisbury and Asheville.
- **Southeastern North Carolina** — Establish a new rail corridor to provide one daily round-trip between Wilmington and Raleigh.

<sup>6</sup> Track improvements are part of the proposed Southeast High-Speed Rail efforts, which will enable speeds of 79 mph; additional investment will be needed to enable targeted speeds of 85-90 mph.



## Observations

- \$2.9 billion (83 percent) of passenger rail needs are related to modernization; the remaining \$572 million in needs (17 percent) is for expansion.
- In the 1990s, population in the Piedmont and Carolinian corridors grew by 30 percent and passenger rail ridership grew by 40 percent; however, services have not increased since the Piedmont service was added in 1995.
- Some of the state's fastest growing areas — Wilmington, Hickory, and Asheville — lack adequate passenger rail service.



25-Year Passenger Rail Needs (millions of constant 2001 dollars)			
Need Category	Statewide	Regional	Total
<b>Existing Corridor</b>			
Capital	\$2,816	—	\$2,816
Operating	\$107	—	\$107
<b>Subtotal Existing</b>	<b>\$2,923</b>		<b>\$2,923</b>
<b>New - Western NC</b>			
Capital	—	\$234	\$234
Operating	—	\$76	\$76
<b>Subtotal Western</b>	<b>—</b>	<b>\$310</b>	<b>\$310</b>
<b>New - Southeastern NC</b>			
Capital	—	\$234	\$234
Operating	—	\$28	\$28
<b>Subtotal Southeastern</b>	<b>—</b>	<b>\$262</b>	<b>\$262</b>
<b>Subtotal New</b>	<b>—</b>	<b>\$572</b>	<b>\$572</b>
<b>Total</b>	<b>\$2,923</b>	<b>\$572</b>	<b>\$3,495</b>

# freight rail

needs and observations

## Freight Rail

Freight rail service in North Carolina provides a combination of statewide and subregional transportation functions. The majority of the State's freight rail system is owned, operated, and maintained by the private sector. The Department's role in freight is mostly limited to the Rail Industrial Access Program, which funds rail investment required by a new or expanded business to encourage economic development. Private facilities are operated by two Class I railroads, CSX Transportation and Norfolk Southern, and 23 short line railroad operations. Class I railroads operate 2,597 miles of track and short lines operate 782 miles, for a total of 3,379 State freight rail miles.

The abandonment of rail lines in North Carolina continues to be a primary challenge for the freight rail industry, rural communities, and shippers. In the past decade, the rate of abandonment in North Carolina slowed, but the fact that the State has lost 700 miles of track since 1971 cannot be overlooked. In addition, only 30 percent of the State's short lines can accommodate heavier (286,000-pound) rail cars. At the same time, greater investment in short lines is key to spurring economic prosperity in the State's rural and small urban areas.<sup>7</sup> A potential solution is to create additional short line railroads and upgrade older tracks to handle heavier rail cars.

## Freight Rail Needs - \$545 Million

Using information contained in the *North Carolina Rail Plan 2000*, the State's 25-year freight rail investment needs total \$545 million. These needs include:

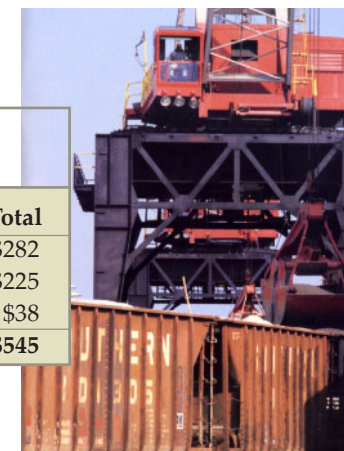
- Track and terminal improvements to both Class I railroads (\$282 million).
- Upgrades to short line railroads (\$225 million).
- Increasing the yearly allocation to the Rail Industrial Access Program (\$38 million).

<sup>7</sup> Based on findings from the 1999 *Rural Property Task Force Report*.

## Observations

- \$507 million (93 percent) of freight rail needs are related to modernization (primarily track/terminal upgrades); the remaining \$38 million in needs (7 percent) are for expansion (i.e., construction or reactivation of tracks).
- One in four of the State's top 200 manufacturers ship materials by rail. Commodities, such as coal, chemicals, farm products, pulp, paper, lumber, wood products, stone, clay, glass, and food accounted for 84 percent of commodities shipped by rail in the state in 1998.
- Significant upgrades to short line rail lines are needed to sustain prosperity in rural and small urban areas; increased funding of the historically successful Rail Industrial Access Program is required to sustain North Carolina's economic prosperity.

25-Year Freight Rail Needs (millions of constant 2001 dollars)			
Need Category	Statewide	Subregional	Total
Class I Track Improvements	\$282	—	\$282
Short Line Rail Improvements	—	\$225	\$225
Rail Industrial Access Program	—	\$38	\$38
<b>Total</b>	<b>\$282</b>	<b>\$263</b>	<b>\$545</b>





### Ferries

North Carolina has the second largest state-owned ferry system in the nation. A total of 25 ferries currently service eight routes located along the North Carolina coast, providing service for over 2.4 million passengers and 850,000 vehicles per year (services are provided free of charge on four of the eight routes). The ferry system serves a combination of statewide and regional transportation functions (based on the function of the transportation facilities to which they connect) and provides an essential service for the water-locked communities and tourists of the State's coastal region.

North Carolina's ferry system is highly successful and popular, but existing facilities are under significant stress. The majority of ferry routes operate at 50 to 75 percent of maximum capacity during peak months and within the next decade, two of the eight existing routes are expected to exceed capacity during peak season. In the next 25 years, all existing services will need additional capacity.

Additionally, eight of the 25 existing ferry vessels are more than 20 years old and as demand for service increases many ferry terminals will require expansion.

### Ferry Needs - \$1.06 Billion

Based on information contained in a capacity analysis of the ferry system conducted in 2001, the State's 25-year ferry investment needs total \$1.06 billion. This estimate includes operating subsidies (total costs less ferry toll revenue) required to meet projected passenger demands.<sup>8</sup> The breakdown of these needs by transportation function is presented in the table to the right.

North Carolina Ferry Routes	
Statewide Function	Regional Function
Hatteras — Ocracoke	Cherry Branch — Minnesott
Ocracoke — Swan Quarter	Bayview — Aurora
Cedar Island — Ocracoke	Currituck — Knotts Island
Southport — Fort Fisher	Currituck — Corolla

<sup>8</sup> Ferry tolls were increased 50 percent to 66 percent in 2002, and subsequent periodic increases to keep pace with inflation are assumed (no fares were assumed for the four routes that currently do not charge fares).

### Observations

- Roughly \$750 million (71 percent) of the needs are for statewide ferry services; the remaining \$310 million in needs (29 percent) are for regional services.
- Preservation needs for existing services total \$720 million (68 percent of total needs), which includes maintenance (e.g., repairs, painting and washing), operations (e.g., utility and labor costs), and facility preservation (e.g., pier reconstruction). Expansion needs total \$339 million (32 percent of total needs).



25-Year Ferry Needs (millions of constant 2001 dollars)			
Need Category	Statewide	Regional	Total
<b>Existing Service</b>			
Capital	\$23	\$7	\$30
Operating	\$483	\$207	\$690
<b>Subtotal Existing</b>	<b>\$506</b>	<b>\$214</b>	<b>\$720</b>
<b>Expanded Service &amp; Facilities</b>			
Capital	\$90	\$23	\$113
Operating	\$153	\$73	\$226
<b>Subtotal Expansion</b>	<b>\$243</b>	<b>\$96</b>	<b>\$339</b>
<b>Total</b>	<b>\$749</b>	<b>\$310</b>	<b>\$1,059</b>



## Observations

- Ten percent of the \$300 million estimate is for statewide improvements, another 10 percent is for regional improvements, and the remaining 80 percent is for subregional needs. This breakdown reflects the fact that improving bicycle/pedestrian facilities in NC (today and in the future) is still driven by local needs.
- One hundred percent of the bicycle and pedestrian facility needs are considered Modernization activities.
- Efforts to mainstream bicycle and pedestrian improvements in the planning process will lead to early inclusion in project scope.
- NCDOT now requires local governments for populations over 5,000 to prepare pedestrian and bicycle plans to receive state funding for bike/pedestrian improvements.

## Bicycle/Pedestrian

In recent years, bicycle and pedestrian facilities have gained widespread acceptance in North Carolina as a legitimate transportation mode that serves an important, albeit subregional, transportation function. This progress is largely due to the efforts of NCDOT's Division of Bicycle and Pedestrian Transportation (DBPT), which actively partners with local governments to identify bike/pedestrian needs and provide technical assistance. The Division, the oldest of its kind in the U.S., acts as a statewide advocate for bicycle/pedestrian safety and establishes policy guidance through materials such as *Bicycling & Walking in North Carolina: A Long-Range Transportation Plan* (1996) and the *Planning and Designing Local Pedestrian Facilities Report* (1997).

Although public interest for bicycle/pedestrian facilities is steadily growing, facility implementation challenges still exist. For example, NCDOT's current policy for sidewalk improvement cost sharing places a substantial financial burden on local governments. In many cases, needed sidewalks or extra width necessary for bicycle lanes are not incorporated into a project due to a lack of local funding. Planning for these types of facilities is now being considered earlier in the NCDOT planning process. Over time, this attempt to "mainstream" bicycle/pedestrian facilities will require additional training and active participation by DBPT staff to update design manuals and planning procedures.

## Bicycle/Pedestrian Needs - \$300 Million

Historically, state spending on stand-alone bicycle and pedestrian projects has been approximately \$6 million per year. Assuming the development of new initiatives, doubling this annual allocation would provide much needed assistance without creating a significant financial burden on NCDOT. Therefore, the total annual bicycle/pedestrian needs are considered to be \$12 million per year, amounting to \$300 million over 25 years. <sup>9</sup>



25-Year Bicycle And Pedestrian Facility Needs (millions of constant 2001 dollars)				
Need Category	Statewide	Regional	Subregional	Total
Bicycle Improvements	\$20	\$20	\$185	\$225
Pedestrian Improvements	\$10	\$10	\$55	\$75
<b>Total</b>	<b>\$30</b>	<b>\$30</b>	<b>\$240</b>	<b>\$300</b>

<sup>9</sup> Figure only reflects projects done independent of any other roadway improvement. Needs for bike/pedestrian projects made in conjunction with a roadway improvement are included in the highway needs estimate.





Observations

- Approximately 42 percent of estimated needs are for preservation activities, 14 percent are for modernization investments, and 44 percent are for expansion-related projects.
- The most significant issue facing airports since September 11, 2001 is the need for improved security and the cost of implementing it.

Aviation

As is typical throughout the country, North Carolina's airport system is owned by local governments and authorities and/or private sector interests, and the NCDOT provides technical and financial assistance to publicly-owned, public-use airports. In total, 125 public-use airports exist in North Carolina, 74 of which are publicly-owned. Of the publicly-owned airports, nine have scheduled commercial service and the remaining 65 are general aviation facilities. The State also has more than 300 privately-owned, private-use airports.

North Carolina's most recent statewide aviation systems planning study was completed in 1995. The Division of Aviation is currently undertaking a comprehensive update, referred to as the *Airport Development Plan Initiative*, which is focusing on the State's publicly owned and operated, general aviation airports. This Statewide Transportation Plan is being prepared to evaluate the needs of the general aviation airports. It will set minimum state standards for airport development, identify total needs, and set priorities for the system's future development.

This *Airport Development Plan Initiative* also will classify the State's airports based on economic development parameters established by the North Carolina Department of Commerce, and identify the investments needed to meet established minimum standards for a given airport category.

Aviation Needs - \$1.02 Billion <sup>11</sup>

Based on initial findings from the *Airport Development Plan Initiative*, and for the purpose of interim planning, the Division of Aviation estimates total needs of \$1.02 billion from 2004 to 2025. These needs are based on a preliminary analysis of the costs required to bring existing general aviation facilities up to minimum State standards. Preservation projects include land acquisition, approach clearing, obstruction removal, maintenance overlays, runway and taxiway lighting rehabilitation and replacements. Modernization projects cover upgrades in technology, navigational aids, and pavement strengthening. Expansion projects include runway extensions, taxiway extensions, and new or replacement airports.

25-Year General Aviation Airport Needs (millions of constant 2001 dollars)			
Preservation	Modernization	Expansion	Total
\$430	\$140	\$447	\$1,017



<sup>11</sup> Funding for aviation improvements come from various federal, state, local, and/or private sources. This funding is dedicated for aviation, meaning the revenues are exclusively for airport improvements and cannot be spent on other modes. Consequently, aviation needs and revenues were excluded from the overall investment scenario discussion and the \$1.02 billion needs figure is simply provided for informational purposes.

## Public Involvement Process and Findings

The Department conducted an extensive Public Involvement Program (PIP) to support the statewide planning process. In addition to satisfying federal public participation requirements, the PIP provided a means for stakeholders to review, challenge, affirm, and/or expand upon the State's transportation needs, planning processes, and future investment direction. Overall, the PIP proved a successful strategy for informing and engaging key agencies, stakeholders, and the general public throughout the life of the Statewide Transportation Plan update.

The PIP employed a variety of techniques to solicit feedback and create a continuous information exchange with stakeholders. Outreach opportunities and Statewide Transportation Plan information was disseminated through a database of over 2,600 individuals and organizations representing the business community, advocacy groups, civic associations, municipal and county officials, Metropolitan (MPOs)/Rural Planning Organizations (RPOs), academic institutions, and other state and regional entities. Specific activities included:

- **Stakeholder Interviews and Outreach Meetings** — Over 40 stakeholder groups participated in interviews and/or small scale outreach meetings. Feedback was solicited through surveys, informal presentations, and participant interaction.
- **Regional Forums** — 14 regional forums were held in urban and rural locations across the State in partnership with local municipalities, regional planning agencies, and other co-sponsors. The format was highly interactive and participatory; each forum included facilitated breakout sessions and the use of visual displays and handouts.
- **Information Distribution** — Statewide Transportation Plan information was made available to a broad range of audiences through a project website, newsletters, and other collateral information. The website included comment and mailing list sign-up forms, and also provided a venue for posting technical reports, meeting notices, and outreach event summaries.



- **Transportation Summit** — The Department held a day-long transportation summit to solicit the views of State leaders. Discussions centered on system needs and the trade-offs associated with various investment strategies. Participants offered policy direction and provided feedback on other transportation challenges.
- **Environmental Justice (EJ) Outreach** — Outreach efforts included meeting with a series of EJ populations/groups. Input from these meetings was then incorporated into the overall planning and decision-making processes.
- **Strategic Highways Regional Forums** — Nine regional forums were held in each of the three main geographical areas of the State (east, central, west) to introduce the Strategic Highway Corridors concept. Forum participants were asked to provide feedback on concept development, selection criteria, and future application. The outreach approach was structured to ensure that both broad statewide and unique regional perspectives were heard.



While the PIP resulted in a broad range of comments, opinions, and ideas, common themes that had a significant impact on the direction of the final Statewide Transportation Plan recommendation included:

- **Planning** — Decentralize planning, improve transportation-land use planning linkages, and consider environmental issues (including EJ issues) earlier in the planning process.
- **Multimodalism/Intermodalism** — Improve multimodal choices/intermodal connections and expand investment in alternative modes, including bicycle and pedestrian facilities, transit systems, and passenger rail service.
- **System Preservation** — Increase the emphasis of preservation and maintenance improvements to the existing system.
- **Finance** — Additional transportation funding, either from higher user fees or new revenue mechanisms, is needed at the State and local levels.
- **Flexibility and Efficiency** — Target dollars to meet the most pressing transportation needs, focus on cost effective investments, and seek ways to leverage existing funding sources.
- **Safety** — Focus on building safe transportation facilities.
- **Quality of Life** — Strengthen considerations of environmental (such as air quality) and community goals in transportation decision-making processes.







## The Recommended Investment Scenario

With nearly \$84 billion in transportation investment needs over the next 25 years and projected revenues of \$55 billion, NCDOT's planning challenge is to prioritize needs to maximize the benefit of transportation investments for North Carolina's stakeholders. In short, the Department needs to be visionary and craft a direction for State transportation investment while financially constraining Statewide Transportation Plan recommendations to ensure they reflect fiscal realities. The culmination of NCDOT's three-year statewide planning process is a response to these challenges — a proposed 25-year *Recommended Investment Scenario* for North Carolina's transportation system that establishes investment priorities and suggests targeted expenditure levels for specific programs and improvement categories.

The *Recommended Investment Scenario* reflects considerable effort by the NCDOT to balance extensive customer feedback, technical analysis findings, and management input. Key steps in the *Recommended Investment Scenario* development process included:

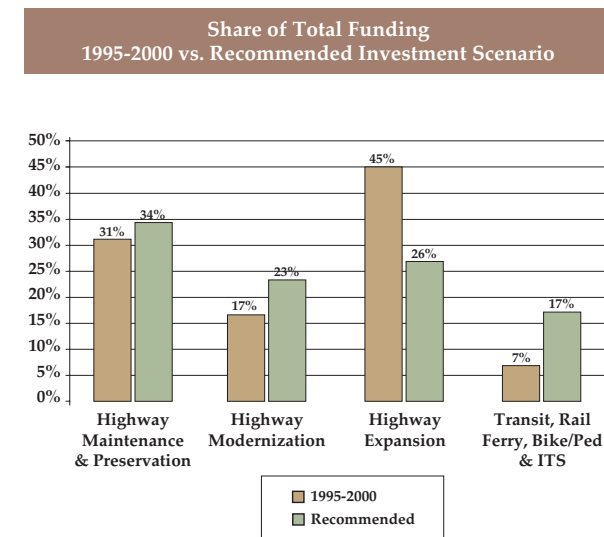
1. Creation of financially constrained "straw man" investment scenarios built around various themes, such as modernization, system preservation, non-highway investment, and maintaining the status quo.
2. Presentation of draft scenarios to the BOT Planning Committee and discussion of trade-offs between different investment strategies.
3. Establishment of Planning Committee consensus through an iterative scenario development process.

The *Recommended Investment Scenario* (summarized in the table on the following page) underscores the importance of *safety* in all investments and places a focus on upgrading and preserving the existing transportation system. It also emphasizes greater investment in the State's highest-use facilities — the infrastructure elements that support high levels of demand and play a critical role in enhancing statewide mobility. Finally, the *Scenario* supports increased investment in non-highway modes, areas that historically have received a disproportionately low percentage of State transportation funding.

## What does this scenario mean and how does it compare with the Department's historic pattern of spending?

In contrast to the last decade, the *Recommended Investment Scenario* increases investment in highway modernization and maintenance/ preservation activities for all modes. Heavier modernization investment will lead to improved safety and traffic flow on congested highways, reconstruction of substandard pavement, and the replacement of structurally deficient bridges. Maintenance/ preservation activities provide newer, fuel-efficient transit buses, repairs to ferry terminals and boats, and the replacement of insufficient guardrail statewide.

It is imperative to understand that the *Recommended Investment Scenario* is based on a statewide perspective of needs, regardless of where and when the needs occur; category funding levels were not constrained based on current legislative requirements that influence programming structures or allocations such as the State's Equity Formula. This means that unique regional needs will need to be balanced within this statewide proposal, requiring yearly review and allocation of resources. As shifts occur in the programming process to address these pressing needs, methods to monitor progress and report improvements must also be advanced.



*The Statewide Transportation Plan will be treated as a "living document" that is routinely updated to reflect changing needs and resources (every two years) and evolving staff and stakeholder interests (every four years).*

the combined total (\$19 billion) is more than 1/3 of total available funding

Historical Allocation Approach vs. Recommended Investment Scenario (needs and funding levels in billions of constant 2001 Dollars)							
	25-Year Needs	Category Funding Levels		Percent of Total Funding		Percent of Needs Met	
		Historical Approach	Recommended Scenario	Historical Approach	Recommended Scenario	Historical Approach	Recommended Scenario
<b><u>Maintenance &amp; Preservation</u></b>							
<b>Highways &amp; Bridges</b>							
Routine Highway Maintenance	\$11.7	\$10.5	\$9.5	19.1%	17.2%	89.9%	80.8%
Highway & Bridge Resurfacing	\$13.1	\$ 6.5	\$9.1	11.8%	16.5%	49.5%	69.2%
Intelligent Trans. Systems	\$ 0.4	\$0.1	\$0.4	0.1%	0.7%	12.5%	100.0%
<b>Alternative Modes</b>							
Public Transportation	\$4.3	\$ 2.2	\$3.2	3.9%	5.8%	50.0%	74.4%
Ferries	\$0.7	\$0.6	\$ 0.5	1.0%	0.9%	78.6%	71.4%
<b>Total Maintenance &amp; Preservation</b>	<b>\$30.2</b>	<b>\$19.8</b>	<b>\$22.6</b>	<b>35.9%</b>	<b>41.1%</b>	<b>65.4%</b>	<b>74.9%</b>
<b><u>System Modernization</u></b>							
<b>Highways &amp; Bridges</b>							
Highway Improvements	\$14.2	\$7.4	\$8.7	13.4%	15.7%	52.0%	60.9%
Intelligent Transportation Systems	\$0.7	\$0.1	\$ 0.4	0.1%	0.7%	8.6%	57.1%
Bridge Improvements	\$5.4	\$1.9	\$ 4.1	3.5%	7.5%	35.7%	76.3%
<b>Alternative Modes</b>							
Passenger Rail	\$2.9	\$ 0.4	\$2.0	0.7%	3.6%	12.8%	68.6%
Freight Rail	\$0.5	\$0.1	\$0.2	0.1%	0.4%	12.0%	44.0%
Bicycle/Pedestrian	\$ 0.3	\$0.2	\$0.2	0.3%	0.4%	56.7%	66.7%
<b>Total System Modernization</b>	<b>\$ 24.0</b>	<b>\$10.0</b>	<b>\$15.6</b>	<b>18.1%</b>	<b>28.3%</b>	<b>41.5%</b>	<b>64.9%</b>
<b><u>System Expansion</u></b>							
New Highways, Add'l Lanes & Urban Loops	\$22.2	\$24.8	\$14.6	45.1%	26.4%	111.8%	65.7%
Public Transportation	\$6.3	\$ 0.3	\$1.8	0.5%	3.3%	4.8%	28.6%
Passenger Rail	\$0.6	\$0.2	\$0.3	0.3%	0.6%	28.3%	51.7%
Freight Rail	\$ 0.1	-	\$0.0	0.0%	0.1%	0.0%	40.0%
Ferries	\$0.3	-	\$0.1	0.0%	0.2%	0.0%	36.7%
<b>Total System Expansion</b>	<b>\$29.5</b>	<b>\$25.3</b>	<b>\$16.8</b>	<b>46.0%</b>	<b>30.5%</b>	<b>85.7%</b>	<b>57.1%</b>
<b>Grand Totals</b>	<b>\$ 83.7</b>	<b>\$55.0</b>	<b>\$55.0</b>	<b>100.0%</b>	<b>100.0%</b>	<b>65.7%</b>	<b>65.8%</b>

funds an additional 10 percent of identified needs

modernization investment yields nearly a 25 percent increase in needs met compared to historical approach

investment still meets 2/3 of all highway expansion needs

Notes:

- The values in this table represent a “snapshot” analysis comprising sum totals of needs and revenue across a 25-year period.
- Historical approach represents a 6-year period of investment (1995-2000)
- For purposes of investment comparison maintenance and preservation categories were lumped together.
- The *Recommended Investment Scenario* only addresses *two-thirds* of all needs and results in a funding gap of almost \$30 billion.



## Implementation

The creation and adoption of this Statewide Transportation Plan is an important accomplishment, but it is only a first step toward implementation of the Recommended Investment Scenario. In order to move the Statewide Transportation Plan forward, a series of strategies and action steps must be enacted. This will require a collaborative approach, similar to the process of the past few years, that benefited from the active involvement of a cross section of NCDOT staff, senior management, and a Board of Transportation (BOT) Committee. Conducting a truly sustained implementation process will require an ongoing review of institutional issues, new planning tools/concepts, and incremental changes to State policies, practices, and laws. The following provides an overview of key strategies and action steps necessary:



- ✿ **Create an Implementation Team (Technical Oversight)** — A team (5-7 individuals) of technical staff representing intra and interdepartmental agencies is recommended to provide executive level oversight and structure to the implementation process. Team members would offer guidance on how to enact individual strategies/action steps, specifically identifying resources and realistic timetables for carrying out the work. Each member would draw upon available data and individuals within their respective departments to investigate and propose changes that fit within the direction of the Recommended Investment Scenario. This team would report directly to senior management and a new BOT Statewide Plan Committee.
- ✿ **Create a BOT Statewide Plan Committee (Policy Oversight)** — Building upon the work of the current Committee, a new, permanent BOT Statewide Plan Committee is recommended. Committee members would review the work of the Implementation Team and act as liaisons to the full BOT in matters of Department-wide policy changes or initiatives.

- ✿ **Pursue Legislative Opportunities** — North Carolina's transportation landscape is controlled by legislation and other formulas that limit how and where revenues can be spent. While these policies have served North Carolina well, adoption of this Statewide Transportation Plan and full implementation of the Recommended Investment Scenario reinforces the need for greater funding flexibility at all levels. This Statewide Transportation Plan is a platform for state policy leaders to review historical statutes and formulas and to consider changes to prescriptive legislation allowing the BOT and NCDOT greater flexibility in long-term planning and programming.
- ✿ **Improve Planning Integration** — NCDOT needs to improve integration between its planning and modal branches and the 14 Highway Divisions. Key action steps include:
  - ✎ Establish mechanisms to incorporate input and analysis from modal staff earlier in the transportation planning process.
  - ✎ Move Planning, Project Development, and Programming functions into a regional orientation (i.e., west, central, east); consider transportation needs from a regional perspective and within the context of the Recommended Investment Scenario.
  - ✎ Build a broader planning capacity at the Division level; provide Division Engineers with the tools to think/act multimodally.
- ✿ **Improve Project Selection Process** — Currently, project selection decisions are dominated by a legislative priority to deliver unfinished portions of the Intrastate and Urban Loops programs, and to implement other major expansion projects. Statewide Transportation Plan implementation requires greater flexibility to direct capital expenditures toward meeting other pressing system needs. Projects under consideration should undergo a more thorough screening evaluation, meet certain technical and needs-based criteria, and ultimately satisfy the guiding investment levels prescribed in the Recommended Investment Scenario.
- ✿ **Invest in Department-wide Tools** — To support improved project selection and prioritization, the Department must develop more robust, enterprise-wide planning and analysis tools, including:
  - ✎ Upgraded information systems and data collection methods that take advantage of emerging technologies.
  - ✎ Enhanced pavement, bridge, and other asset management databases that help compare competing investment choices.
  - ✎ Mechanisms to augment the use of non-technical criteria into the overall decision-making process, including, public opinion, economic development, resource impacts, delivery time, and environmental considerations.

## Implementation (cont.)

- ⚙ **Monitor and Report Progress** — The creation of well-developed monitoring systems and performance reporting mechanisms will help NCDOT and the BOT improve agency visibility and credibility with legislators, local officials, media, and stakeholder groups. At a minimum, performance measures should be established for program delivery, use of federal funds, and overall system performance. Similar to other states, NCDOT should report progress towards achieving stated goals on a regular basis.
- ⚙ **Establish Revision Cycles** — In order to keep the Statewide Transportation Plan a "living document" that contains robust data and reflects changing public interests, an ambitious Revision Cycle must be established. Specifically, Statewide Transportation Plan data (needs and revenue) should be updated every two years (starting in 2006) to coincide with the legislative biennium. Updated information should be reported to the BOT and Legislature (early 2007) and presented in the context of previous Statewide Transportation Plan recommendations. A lengthier, more comprehensive Statewide Transportation Plan update, including public and stakeholder outreach, should be conducted every four years. This update (beginning in late 2008/early 2009) will provide an opportunity to solicit public sentiment on Statewide Transportation Plan accomplishments and could serve to reinforce and/or reconsider future investment direction.
- ⚙ **Advance the Strategic Highway Corridors Concept** — In keeping with the *Recommended Investment Scenario* and to reinforce NCDOT's new emphasis on a targeted mobility approach, NCDOT should adopt a formal policy to recognize and advance the Strategic Highway Corridors concept. Appendix A provides the Policy Statement, which notes support for and directs future use of this concept. This concept emphasizes the need to improve, protect, and maximize the capacity of a set of existing highways that are critical to statewide mobility and regional connectivity. Each corridor represents an opportunity for NCDOT and stakeholders to consider long-term vision, decision-making consistency, land use partnerships, and overarching design/operational changes.

The following criteria, along with input from the public, BOT, & NCDOT staff guided the Strategic Highway Corridors selection process:

- Mobility — corridor currently serves or has the potential to expeditiously move large volumes of traffic; a facility vital to the state's and/or region's interest.
- Connectivity — corridor provides a connection between activity centers, including cities, airports, military bases, seaports, etc.
- Interstate Connectivity — corridor provides a connection between existing and/or planned interstates.
- Interstate Reliever — corridor currently serves or has the potential to serve as a reliever route to an existing interstate facility.
- Hurricane Evacuation Routes — corridor represents a major route from within North Carolina's Emergency Management's Coastal Evacuation Route Map.
- Cited in a Prominent State Report — for example, the *Rural Prosperity Task Force Report*.
- Part of a National, Statewide, Economic, or Military Highway System — for example, the National Highway System or STRAHNET.

The Strategic Highway Corridors concept includes several goals. In particular, the concept supports the creation of a genuine and consensus-based vision for each Corridor (i.e., identification of the desired facility type for each corridor). This approach is expected to influence key decisions related to funding, project planning, design, access, and local land use decisions. As this concept advances, future Statewide Transportation Plan updates will assess progress including results of corridor studies and costs for improving those corridors.

The map on the following page is a visual representation of the selected Corridors. This Vision Plan proposes a future facility type improvement for each corridor. The map is meant to communicate a long-term vision, with individual improvements still subject to current federal and state project planning requirements. A more detailed explanation of each Facility Type can be found in Appendix B.

Strategic Highway Corridors represents a planning direction for highway improvements that limit and/or minimize impact to the surrounding environment while strengthening economic opportunities for communities and regional areas across the state.

All future information regarding this concept will be found at:  
<http://www.ncdot.org/planning/tpb/shc>



## Vision Plan

Adopted by The North Carolina  
Board of Transportation

Plan Date: September 2, 2004



### Legend

#### Freeways

- Existing
- Needs Upgrade
- Recommended

#### Expressways

- Existing
- Needs Upgrade
- Recommended

#### Boulevards

- Existing
- Needs Upgrade
- Recommended

#### Thoroughfares

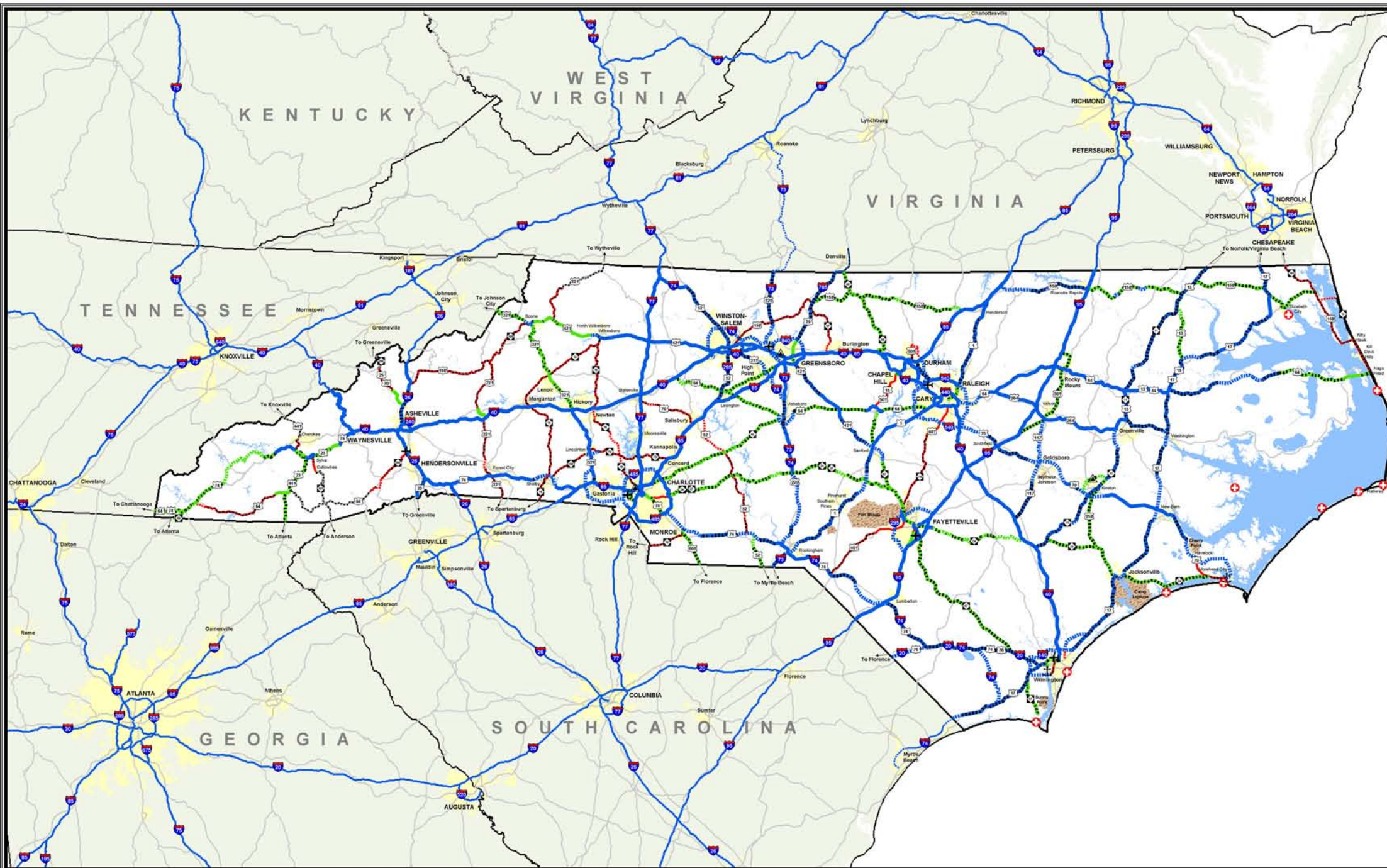
- Existing
- Needs Upgrade
- Recommended

- US/Other Route
- State Port
- Major Airport
- Intermodal Connector
- Coast Guard Station
- Major Military Base
- Urban Area
- Water Features

0 5 10 20 30 40 50 Miles

Prepared By:  
The North Carolina Department of Transportation  
Transportation Planning Branch

Base Map Date: March 29, 2004





## Final Considerations

The baseline revenue forecast developed for the Statewide Transportation Plan shows that resources from existing revenue streams will fall well short of addressing North Carolina's total transportation investment needs over the next 25 years. The anticipated funding shortfall, and its implications for the State's transportation future, set the stage for consideration of the priorities that would be addressed should additional funding be made available, and for discussions about potential actions to increase transportation revenues.

Full implementation of the initiatives listed above would require a revenue increase of 15 percent, beginning in the first year of the plan. Given that any successful funding initiative will likely fall well short of meeting all needs, the availability of additional funds will once again bring the prioritization challenge to center stage. In order to make the best possible decisions, NCDOT will need to revisit statewide needs and priorities, and will need time to accomplish necessary legislative, policy, and process changes needed to make implementation possible.

If new funding does become available, the starting point for this dialogue should be the following list of initiatives, which totals \$8.42 billion and is based on technical analysis and public involvement input:

- **Fully fund highway maintenance on the Statewide Tier** — \$200 million.
- **Eliminate the pavement resurfacing backlog on Statewide & Regional Tiers** — \$85 million.
- **Address additional Subregional Tier accruing resurfacing needs** — \$1.375 billion.
- **Widen additional Regional and Subregional Tier narrow lanes** — \$420 million and \$550 million respectively.

- **Widen additional narrow Subregional Tier bridges** — \$140 million.
- **Address remaining backlog of needed additional lanes on Interstates** — \$1.29 billion (rural) and \$750 million (urban).
- **Address remaining non-interstate (Statewide Tier) freeway needs for reconstruction and additional lanes needs** — \$580 million (rural reconstruct), \$1.15 billion (additional lanes).
- **Address additional highway new location needs** — \$1.0 billion.
- **Fund the remaining metro transit preservation needs** — \$800 million.
- **Fund operating needs for transit capital expansion** — \$300 million.
- **Fund an additional passenger rail route** — \$260 million.
- **Fund remaining ferry preservation needs** — \$220 million.

A plausible assumption is that an overall revenue increase of 10 to 15 percent could be staged to take effect over the last 15 to 20 years of the Plan timeframe. Such an initiative could provide \$3 to \$7 billion (2001 dollars) in additional revenues. The following below provides an illustration of a **hypothetical** tax/fee increase package that would address most of the activities listed above.

Potential Transportation Revenue Enhancement Initiatives (figures in \$ billions)			
Revenue Type	Amount of Increase	17-year yield (nominal \$)	17-year yield (2001 \$)
Motor Fuels Tax	4 cents (~20%)	5.51	3.44
Auto Registration Fee	\$10 (~20%)	1.23	0.76
Truck Registration Fee	25%	0.76	0.47
Statewide Sales Tax	1/8 % (~3%)	3.63	2.25
<b>TOTAL</b>		<b>\$11.13</b>	<b>\$6.92</b>

As the table above shows, addressing just a quarter of North Carolina's projected funding shortfall will require significant increases to existing sources. To fully address the \$30 billion funding gap, North Carolina clearly will need to explore other funding options. The resulting dialogue should include a discussion of both traditional sources and a broader range of options, such as local tax options, local cost sharing, tolling, and other user-based fees.



## Glossary

**Access** — the ability to reach or connect to a transportation facility (e.g. from an individual property or another mode).

**AMTRAK** — National Railroad Passenger Corporation; serves more than 500 stations in 46 states and operates over 22,000 passenger rail route-miles.

**Baseline Projection** — a 25-year revenue projection that assumes continuation of existing transportation funding sources and no new funding sources or revisions to existing user fees.

**Bike Lane** — portion of a roadway which has been designated by striping, signing and pavement markings for the preferential or exclusive use of bicyclists.

**Bikeway** — road, path, or way specifically designated as being open to bicycle travel, regardless of whether such facilities are designated for the exclusive use of bicycles or are to be shared with other transportation modes.

**Bus Rapid Transit (BRT)** — a rapid transit concept that incorporates many of the features of urban rail systems using rubber-tired vehicles.

**Capital Transit Needs** — for the purposes of this Statewide Transportation Plan, "capital" transit needs include vehicles, maintenance/repair facilities, passenger facility repairs/upgrades, and diagnostic equipment.

**Commercial Service Airport** — public airport that annually enplanes 2,500 or more passengers and receives scheduled airline passenger service.

**Commuter** — someone who travels regularly between home and work or school.

**Commuter Rail** — mode of travel utilizing a multi-car system along an existing rail corridor (mainly, freight lines), usually connecting cities or suburban metropolitan areas to an urban core with limited stops.

**Constant Dollars** — dollar figures that have been adjusted for inflation. Converting revenue figures to constant dollars allows for an "apples to apples" comparison between projected revenues and estimated costs (all figures for this report are in 2001 dollars).

**Corridor** — a broad geographical land area that is linear, connects major sources of trips, and may contain a number of streets, highways, transit lines, and routes; generally follows an interstate, freeway, or major roadway.

**Class I Railroads** — private sector rail firms that transport freight over long distances.

**Enplanement** — an aviation industry term that refers to a person getting on or off a plane at a gate within a designated airport.

**Environmental Justice Populations** — historically ethnic and low-income groups who do not typically participate in the planning process and have been under-represented and/or underserved by the transportation system.

**Expansion** — activities focused on adding capacity or new facilities/services.

**Facility** — the means by which transportation is provided - e.g., highway, railroad, sidewalk.

**Ferry Vessel** — ship (generally steam or diesel-powered) for carrying passengers and/or vehicles over a body of water; may also be a hovercraft or other high speed vessel.

**Ferry Capital Costs** — non recurring infrastructure include activities such as boat replacement and dock improvements.

**Ferry Operating Needs** — estimated cost associated with running the State's ferries and include costs such as labor, maintenance and utilities.

**Freight Rail** — transport of manufactured goods, natural resources, and agricultural products via railroad facilities.

**General Service Airport** — an airport that services smaller corporate aircraft, such as twin-engine aircraft, and the operation of general aviation aircraft for business and pleasure.

**High Speed Rail** — rail operations with top speeds over 79 MPH. Provides an alternative to air and auto travel for trips between 100 and 500 miles.

**Human Service Transit** (a.k.a. Demand Response; Dial-A-Ride; Paratransit) — transit mode comprised vans or buses operating in response to calls from passengers or their agents to a central dispatcher.

**Intermodal** — interconnectivity between various types (modes) of transportation.

**Investment Scenario** — hypothetical allocation of available resources over an array of investment types and improvement categories by mode.

**ITS (Intelligent Transportation Systems)** — advanced traffic operations and communications technologies that increase traffic flow on existing facilities, improve safety, and provide better and more accurate traveler information.

**Land Use** — characteristics that specify certain development parameters for real property, usually made at the local level through a land use plan and/or zoning.

**Maintenance** — regular, routine roadway and bridge treatments that sustain highway conditions.

## Glossary (cont.)

**Mainstreaming** — the process of routinely considering/accommodating bicycle and pedestrian needs and features within the highway design process as each highway improvement is planned and designed.

**Metropolitan Planning Organization (MPO)** — a federally mandated transportation policy-making entity made up of representatives from local government and transportation authorities for urban areas with populations greater than 50,000. MPOs are responsible for developing long-range transportation plans and Transportation Improvement Plans (TIP) for their respective regions, while ensuring transportation projects and programs are based on a comprehensive, cooperative, and continuing (3-C) planning process.

**Mobility** — the ability to travel safely and unimpeded along single or linked transportation facilities.

**Mode/Modal** — a particular form of transportation facility, service, or mean — (e.g., bicycle/pedestrian, highway, transit, aviation).

**Modernization** — improvements related to upgrading system safety, functionality, and overall operational efficiency, without adding major physical capacity.

**Multimodal** — the availability of multiple transportation options, especially within a system or corridor.

**NCMIN (North Carolina Multimodal Investment Network)** — represents the major physical transportation framework upon which transportation planning, investment and economic development strategies can be applied; used as a basis for evaluating the existing system as well as describing the future transportation network—broken into three Tiers: Statewide, Regional, Subregional.

**NHS (National Highway System)** — the Interstate Highway System as well as other roads important to the nation's economy, defense, and mobility; developed by the US Department of Transportation in cooperation with the states, local officials, and metropolitan planning organizations.

**North Carolina: *Moving Ahead!*** — transportation initiative sponsored by Governor Easley in 2003 to redirect the use of remaining bonds to invest in highway maintenance/modernization and public transit.

**Operating Transit Needs** — For the purposes of this Statewide Transportation Plan, "Operating" needs include labor, fuel, insurance, advertising, marketing and administration.

**Passenger Rail** — typically inter-regional or interstate rail service; as compared to commuter rail which is primarily within a metropolitan region.

**Pedestrian** — one who walks or journeys on foot; a walker.

**Preservation** — activities that protect the infrastructure and extend facility service life.

**Public Involvement** — process through which government communicates with its stakeholders using a series of products, tools, documents and outreach opportunities.

**Public Transportation** — transportation by bus, rail (commuter or light), ferry or other transport, either publicly or privately owned, which is provided to the public or specialty service on a regular and continuing basis.

**Regional Tier** — NCMIN tier of facilities providing regional connectivity (typically most NC marked routes, some secondary routes, bus rapid transit lines, light rail).

**Rural Planning Organization (RPO)** — planning entities for rural (non-MPO) areas of three to 15 counties (establishment is voluntary). Core roles include: 1) development and prioritization of transportation projects for input into the Statewide Transportation Improvement Program (STIP); (2) coordination of local and regional multi-modal transportation plans; (3) providing an information clearinghouse (information resource center); and, (4) providing a mechanism for meaningful public participation.

See also: <http://www.ncdot.org/planning/rpo/rpostudy.pdf>

**Short Line Railroad** — independently-owned and operated entities often servicing shorter segments of track across the nation (below Class I railroads).

**Statewide Tier** — highest order facilities in the NCMIN, emphasizing mobility and long distance travel (interstate/most US highways, passenger rail).

**Southeast High Speed Rail (SEHSR)** — one of five US DOT-designated national high-speed rail corridors across the country. The SEHSR — extending from Washington, D.C. through Richmond and Raleigh to Charlotte — has been identified as the most economically viable high speed rail corridor in the country.

**Subregional Tier** — NCMIN facilities with the lowest volumes, primarily providing access to property (secondary roads, short line rail, fixed route transit, human service transit).

**TEA-21 (Transportation Equity Act for the 21st Century)** — Congressional act authorizing Federal surface transportation programs for highways, highway safety, and transit for the six-year period from 1998-2003.

**TIP (Transportation Improvement Program)** — federally-mandated, fiscally constrained schedule that prioritizes transportation projects and studies of regional or statewide significance that covers a minimum period of three years. (7 years in North Carolina.)

**VMT (Vehicle Miles Traveled)** — a measure of highway use; measures the total miles traveled by all vehicles in the area for a specified time period (one vehicle traveling one mile is one vehicle-mile).



## NCDOT Goals

1. **Mobility** – Provide the infrastructure necessary to optimize mobility and reliability in the transportation of passengers and freight.
2. **Maintenance and Preservation** – Protect the public investment in North Carolina's transportation system.
3. **Economic Development and Efficiency** – Provide transportation investments to support economic development for existing and new economic activity.
4. **Safety** – Promote safety on individual facilities and on a system-wide basis in a cost-effective manner.
5. **Modal Options** – Provide a variety of transportation options for personal travel and goods movement.
6. **Efficient and Balanced Community Growth and Development** – Encourage the development of growth management mechanisms intended to coordinate infrastructure investment with development.
7. **Intermodal Efficiency and Connectivity** – Increase the efficiency of the overall transportation system by facilitating the interconnection of transportation modes.
8. **Fiscal Stewardship** – Provide strong fiscal stewardship that maximizes the cost-efficiency of transportation system investment and ensures adequate resources for transportation through traditional and non-traditional sources.
9. **Environmental Stewardship** – Maximize compatibility of the transportation system with environmental considerations, as well as with the historic and cultural resources of the state.
10. **Coordination** – Provide increased responsibility and continuing cooperation, coordination, and participation with NCDOT's customers: the public, stakeholders, private sector, and local, regional, state, and federal governments.

## Statewide Transportation Plan Participants

NCDOT would like to thank the public and the following organizations who have contributed to this planning process:

Wilson Economic Development Council	NC MPOs
NC Council of Churches	NC Public Transportation Association
Conservation Council of NC	NC Department of Commerce
NC Division of Motor Vehicles	Western Piedmont Council of Government
NC State Ports Authority	City of Charlotte Chamber of Commerce
NC Department of Environment & Natural Resources	Carolinas Assoc. for Passenger Trains
NC Research Triangle Foundation	Wayne County Chamber of Commerce
NC Trucking Association	El Pueblo, Inc.
NC Sierra Club	Greensboro Chamber of Commerce
NC Alliance for Transportation Reform	NC Citizens for Business & Industry
NC Institute for Transportation Engineers	Wake County Division of Health and Human Services
NC Wildlife Resource Commission	NC General Assembly - Joint Transportation Oversight Committee
House of Raeford Farms	NC Department of Health and Human Services
NC Rails-Trails	Governor's Advisory Council on Aging
NC American Planning Association	NC RPOs
NC Association of County Commissioners	NC AFL-CIO
NC League of Municipalities	NC Environmental Justice League
Railway Association of NC	NC NAACP
NC Bicycle Committee	NC Democracy South
Eastern Carolina Council	ECU Associate Vice Chancellor for Economic Development & Community Engagement
NC Railroad Company	Charlotte Banking Industry
Wilmington Regional Assoc. of Realtors & Home Builders Association	

# Appendices



Appendix A:  
Strategic Highway  
Corridors Policy  
Statement



POLICY

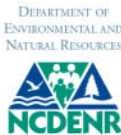
It is the policy of the North Carolina Department of Transportation (NCDOT), in partnership with the North Carolina Department of Commerce and the North Carolina Department of Environment and Natural Resources to recognize and further study a set of Strategic Highway Corridors. These Corridors, as identified and described in the Strategic Highway Corridors Concept Report, articulate a new planning focus for North Carolina. They represent a tool to enhance the mobility function of critical highway facilities and provide an opportunity for each Agency to proactively partner with stakeholders and the public to consider long-term vision, consistency in decision-making, land use partnerships, and overarching design and operational improvements.

The Strategic Highway Corridors concept represents the first major implementation step to be advanced under the update of North Carolina's Long-Range Statewide Multimodal Transportation Plan. Consistent with the Plan's 25-year investment direction, Strategic Highway Corridors recognizes the need to improve and maximize the use of a distinct set of existing highways. These Corridors are critical to statewide mobility and connectivity and promote a vision of modern, efficient transportation supportive of economic opportunities and environmental excellence.

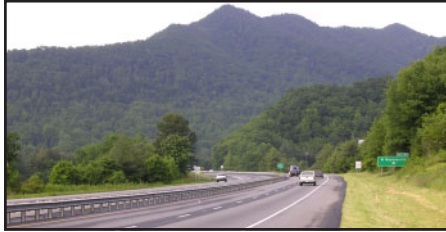
Adopted by the North Carolina Board of Transportation September 2, 2004

PURPOSE

- Promote statewide economic prosperity and support the department's environmental stewardship goals
- Preserve North Carolina's taxpayer investment in critical highway corridors
- Enhance major corridor mobility within and to destinations just outside North Carolina
- Enhance connectivity of intrastate and interstate travel
- Partner with stakeholders and all vested Agencies to create an up front vision for each Corridor
- Identify a desired facility type for each Corridor as Freeway, Expressway, Boulevard, or Thoroughfare
- Influence Systems Planning, Funding, Project Planning, Design, Access Management, and Local Land Use decisions along Corridors to achieve broader goals



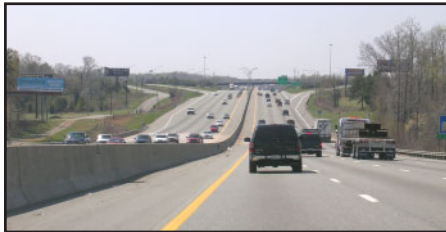
## Appendix B: Strategic Highway Corridors Facility Types



US 74 in Waynesville



US 264 east of I-95 (Wilson Bypass)



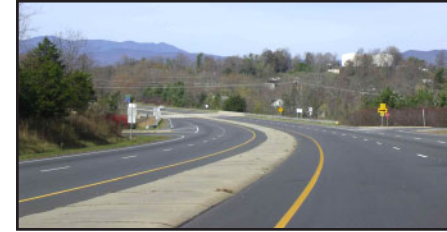
I-40/85 in Orange County



US 64 in Rocky Mount

### Freeways

- **Functional Purpose:**  
High Mobility, Low Access
- **AASHTO Design Classification:**  
Interstate or Freeway
- **Posted Speed Limit:** 55 mph or greater
- **Control of Access:** Full
- **Traffic Signals:** Not Allowed
- **Driveways:** Not Allowed
- **Cross-Section:**  
Minimum 4 Lanes with a Median
- **Connections:**  
Provided only at Interchanges; All Cross Streets are Grade-Separated
- **Median Crossovers:**  
Public-use Crossovers Not Allowed; U-turn Median Openings for Use by Authorized Vehicles Only when Need is Justified
- **Examples:**  
I-40, I-95, US 64 between Rocky Mount and Williamston, US 52 between Lexington and Mount Airy, US 70 between Kinston and New Bern, US 74 near Waynesville, US 264 east of I-95 (Wilson Bypass), US 1 between Raleigh and Sanford



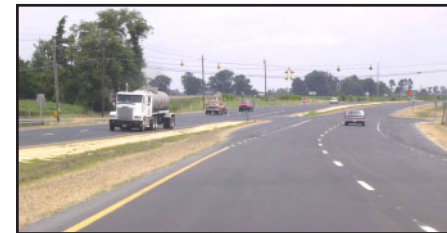
US 221 (Marion Bypass)



US 220 in Rockingham County



US 321 south of Lenoir



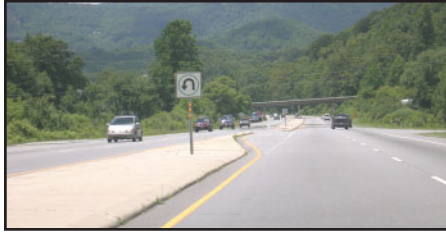
US 117 north of I-40

### Expressways-Type I

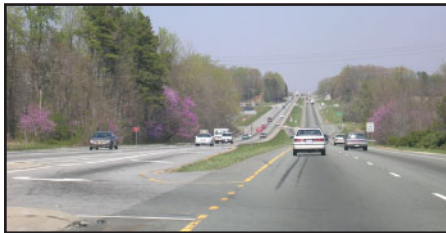
- **Functional Purpose:**  
High Mobility, Low Access
- **AASHTO Design Classification:**  
Arterial
- **Posted Speed Limit:** 50 mph to 60 mph
- **Control of Access:** Limited
- **Traffic Signals:** Not Allowed
- **Driveways:** Not Allowed
- **Cross-Section:**  
Minimum 4 Lanes with a Median
- **Connections:**  
Provided only at Interchanges for Major Cross Streets and At-Grade Intersections for Minor Cross Streets; Use of Acceleration and Deceleration Lanes for At-Grade Intersections
- **Median Crossovers:**  
Allowed; Minimum Spacing between All-movement Crossovers is 2000 feet
- **Examples:**  
US 221 (Marion Bypass), US 220 in Rockingham County, US 321 south of Lenoir, US 117 north of I-40



## Appendix B: Strategic Highway Corridors Facility Types (cont.)



US 74 west of Waynesville



US 29 in Guilford County



US 301 north of Wilson



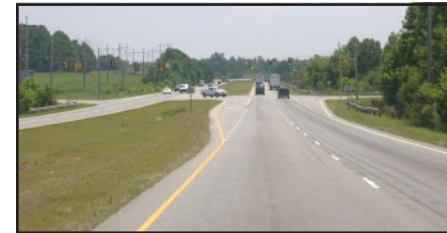
US 64 in Apex

### Expressways-Type II

- **Functional Purpose:**  
High Mobility, Moderate Access
- **AASHTO Design Classification:** Arterial
- **Posted Speed Limit:** 50 mph to 60 mph
- **Control of Access:** Partial
- **Traffic Signals:** Not Allowed
- **Driveways:**  
Allowed (Up to One Driveway Connection per Parcel); Consolidate and/or Share Driveways and Limit Access to Connecting Streets or Service Roads; Restrict to Right-in/Right-out only
- **Cross-Section:**  
Minimum 4 Lanes with a Median
- **Connections:**  
Provided only at Interchanges for Major Cross Streets and At-Grade Intersections for Minor Cross Streets; Use of Acceleration and Deceleration Lanes for At-Grade Intersections
- **Median Crossovers:**  
Allowed; Minimum Spacing between All-movement Crossovers is 2000 feet
- **Examples:**  
US 74 just east of I-277 in Charlotte, US 74 west of Waynesville, US 29 in Guilford County, US 301 north of Wilson, US 64 in Apex



NC 11 (Kenansville Bypass)



US 70 east of Clayton



US 70 near Havelock



NC 24 (Harris Boulevard) in Charlotte

### Boulevards-Type I

- **Functional Purpose:**  
Moderate Mobility, Low Access
- **AASHTO Design Classification:**  
Arterial or Collector
- **Posted Speed Limit:** 30 mph to 55 mph
- **Control of Access:** Limited
- **Traffic Signals:** Allowed
- **Driveways:** Not Allowed
- **Cross-Section:**  
Minimum 2 Lanes with a Median
- **Connections:**  
At-Grade Intersections for Major and Minor Cross Streets (Occasional Interchange at Major Crossing); Use of Acceleration and Deceleration Lanes
- **Median Crossovers:**  
Allowed; Minimum Spacing between All-movement Crossovers is 2000 feet (posted speed limit of 55 mph or greater) or 1200 feet (posted speed limit of 45 mph or less)
- **Examples:**  
US 70 between Clayton and Smithfield, NC 55 (Holly Springs Bypass), NC 11 (Kenansville Bypass), NC 87 (Elizabethtown Bypass), US 158 (Murfreesboro Bypass), US 70 near Havelock, NC 24 (Harris Boulevard) in Charlotte

## Appendix B: Strategic Highway Corridors Facility Types (cont.)

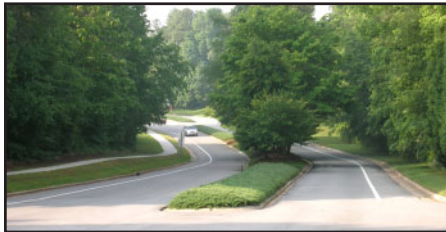
### Boulevards-Type II



US 70 east of Goldsboro



Cary Parkway



Lochmere Drive in Cary



US 74 near Ranger

- **Functional Purpose:**  
Moderate Mobility, Moderate Access
- **AASHTO Design Classification:**  
Arterial or Collector
- **Posted Speed Limit:** 30 mph to 55 mph
- **Control of Access:** Partial or None
- **Traffic Signals:** Allowed
- **Driveways:**  
Allowed; Encourage Consolidation and/or Sharing of Driveways and Limiting Access to Connecting Streets or Service Roads; Restrict to Right-in/Right-out only, if possible
- **Cross-Section:**  
Minimum 2 Lanes with a Median
- **Connections:**  
At-Grade Intersections for most Major and Minor Cross Streets (Occasional Interchange at Major Crossing); Use of Acceleration and Deceleration Lanes
- **Median Crossovers:**  
Allowed; Minimum Spacing between All-movement Crossovers is 2000 feet (posted speed limit of 55 mph or greater) or 1200 feet (posted speed limit of 45 mph or less)
- **Examples:**  
US 1 (Capital Blvd) in Raleigh, US 74 through Monroe, US 117 south of Goldsboro, US 70 east of Goldsboro, Cary Parkway, NC 132 (College Road) in Wilmington, Lochmere Drive in Cary, US 74 near Ranger



Old Concord Road in Charlotte



Hillsborough Street in Raleigh



Shamrock Road in Charlotte



Trinity Road in Raleigh

### Thoroughfares

- **Functional Purpose:**  
Moderate to Low Mobility, High Access
- **AASHTO Design Classification:**  
Collector or Local
- **Posted Speed Limit:** 25 mph to 55 mph
- **Control of Access:** None
- **Traffic Signals:** Allowed
- **Driveways:**  
Allowed with Full Movements; Consolidate or Share Connections, if possible
- **Cross-Section:**  
Minimum 2 Lanes; No Median; Includes All Facilities with a Two Way Left Turn Lane
- **Connections:**  
Primarily At-Grade Intersections
- **Median Crossovers:** Not Applicable
- **Examples:**  
Old Concord Road in Charlotte, Hillsborough Street in Raleigh, Shamrock Road in Charlotte, Trinity Road in Raleigh



Control of Access Types

**Full Control of Access**

Connections to a facility provided only via ramps at interchanges. All cross-streets are grade-separated. No private driveway connections allowed. A control of access fence is placed along the entire length of the facility and at a minimum of 1000 feet beyond the ramp intersections on the Y lines (minor facility) at interchanges (if possible).

**Limited Control of Access**

Connections to a facility provided only via ramps at interchanges (major crossings) and at-grade intersections (minor crossings and service roads). No private driveway connections allowed. A control of access fence is placed along the entire length of the facility, except at intersections, and at a minimum of 1000 feet beyond the ramp intersections on the Y lines (minor facility) at interchanges (if possible).

**Partial Control of Access**

Connections to a facility provided via ramps at interchanges, at-grade intersections, and private driveways. Private driveway connections are normally defined as a maximum of one connection per parcel. One connection is defined as one ingress and one egress point. The use of shared or consolidated connections is highly encouraged. Connections may be restricted or prohibited if alternate access is available through other adjacent public facilities. A control of access fence is placed along the entire length of the facility, except at intersections and driveways, and at a minimum of 1000 feet beyond the ramps terminals on the minor facility at interchanges (if possible).

**No Control of Access**

Connections to a facility provided via ramps at interchanges, at-grade intersections, and private driveways. No physical restrictions, i.e., a control of access fence, exist. Normally, private driveway connections are defined as one connection per parcel. Additional connections may be considered if they are justified and if such connections do not negatively impact traffic operations and public safety.

References

- 1. American Association of State Highway and Transportation Officials (AASHTO), *A Policy on Geometric Design of Highways and Streets*, 4th Edition, 2001
- 2. North Carolina Department of Transportation (NCDOT), *Design Manual*, 2002
- 3. North Carolina Department of Transportation (NCDOT), *Policy on Street and Driveway Access to North Carolina Highways*, 2003
- 4. North Carolina Department of Transportation (NCDOT), *Median Crossover Guidelines*, 2004

Appendix B: Strategic Highway Corridors Facility Types (cont.)

	Freeways	Expressways-Type I	Expressways-Type II	Boulevards-Type I	Boulevards-Type II	Thoroughfares
Functional Purpose	High Mobility, Low Access	High Mobility, Low Access	High Mobility, Moderate Access	Moderate Mobility, Low Access	Moderate Mobility, Moderate Access	Moderate to Low Mobility, High Access
AASHTO Design Classification	Interstate or Freeway	Arterial	Arterial	Arterial or Collector	Arterial or Collector	Collector or Local
Posted Speed Limit	55 mph or greater	50 mph to 60 mph	50 mph to 60 mph	30 mph to 55 mph	30 mph to 55 mph	25mph to 55 mph
Control of Access	Full	Limited	Partial	Limited	Partial or None	None
Traffic Signals	Not Allowed	Not Allowed	Not Allowed	Allowed	Allowed	Allowed
Driveways	Not Allowed	Not Allowed	Allowed (Up to One Driveway Connection per Parcel); Consolidate and/or Share Driveways and Limit Access to Connecting Streets or Service Roads; Restrict to Right-in/Right-out only	Not Allowed	Allowed; Encourage Consolidation and/or Sharing of Driveways and Limiting Access to Connecting Streets or Service Roads; Restrict to Right-in/Right-out only, if possible	Allowed with Full Movements; Consolidate or Share Connections, if possible
Cross-Section	Minimum 4 Lanes with a Median	Minimum 4 Lanes with a Median	Minimum 4 Lanes with a Median	Minimum 2 Lanes with a Median	Minimum 2 Lanes with a Median	Minimum 2 Lanes; No Median; Includes Facilities with Two Way Left Turn Lane
Connections	Provided only at Interchanges; All Cross Streets are Grade-Separated	Provided only at Interchanges for Major Cross Streets and At-Grade Intersections for Minor Cross Streets; Use of Acceleration and Deceleration Lanes for At-Grade Intersections	Provided only at Interchanges for Major Cross Streets and At-Grade Intersections for Minor Cross Streets; Use of Acceleration and Deceleration Lanes for At-Grade Intersections	At-Grade Intersections for most Major and Minor Cross Streets (Occasional Interchange at Major Crossing); Use of Acceleration and Deceleration Lanes	At-Grade Intersections for most Major and Minor Cross Streets (Occasional Interchange at Major Crossing); Use of Acceleration and Deceleration Lanes	Primarily At-Grade Intersections
Median Crossovers	Public-use Crossovers Not Allowed; U-turn Median Openings for Use by Authorized Vehicles Only when Need is Justified	Allowed; Minimum Spacing between All-movement Crossovers is 2000 ft	Allowed; Minimum Spacing between All-movement Crossovers is 2000 ft	Allowed; Minimum Spacing between All-movement Crossovers is 2000 ft (posted speed limit of 55 mph or greater) or 1200 ft (posted speed limit of 45 mph or less)	Allowed; Minimum Spacing between All-movement Crossovers is 2000 ft (posted speed limit of 55 mph or greater) or 1200 ft (posted speed limit of 45 mph or less)	Not Applicable



